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ALLOY STEELS IMPORTANT IN VALVE MANUFACTURE

Rigid Inspection Program Enforced in Production of New Aircraft Engine Valve

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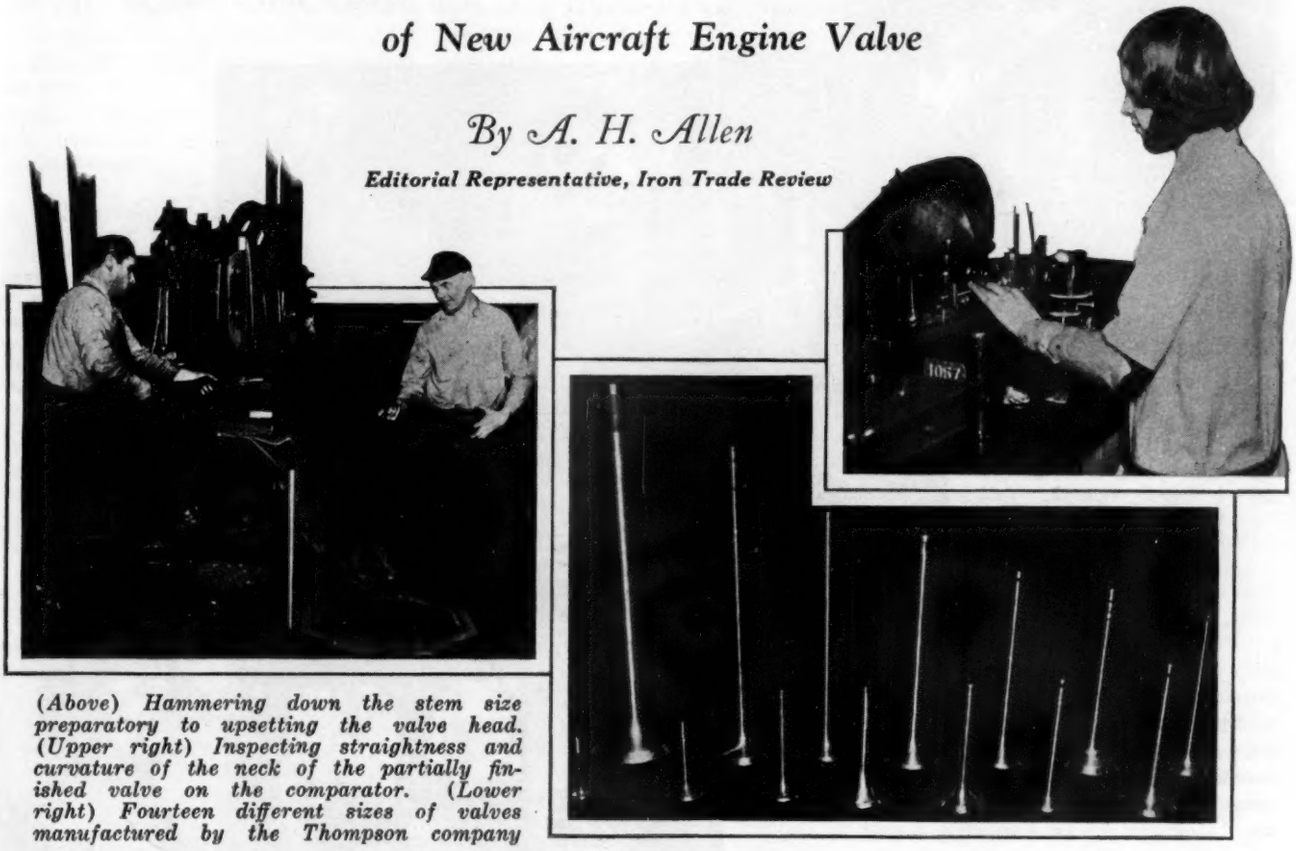


(Above) Hammering down the stem size preparatory to upsetting the valve head. (Upper right) Inspecting straightness and curvature of the neck of the partially finished valve on the comparator. (Lower right) Fourteen different sizes of valves manufactured by the Thompson company

VALVES have been called, and rightfully so, the heart of the internal combustion engine. In external appearance the valve suggests a comparatively simple process of manufacture, but the reverse is true; it is a product of specialized and precision operations, receiving a final O. K. only after a lengthy series of inspections and gagings has been carried out through the entire range of manufacturing steps. A large majority of all airplane engine valves and a large number of automobile engine valves are manufactured by Thompson Products Inc., whose main valve plant is located at 2196 Clarkwood road, Cleveland. In addition to these two types of internal combustion engine valves, the company's products include valves for diesel engines, motorcycle engines, marine engines and numerous other miscellaneous types, all turned

out in production quantities. At present, production averages around 70,000 finished valves per day while as high as 126,000 pieces have been turned out in a single day.

Manufacturing Methods Change

The internal combustion engine valve has had a varied history. The first to be made was turned down from a solid bar of steel, a plan which, due to the waste and excess work involved, was soon modified. A later development was to weld the head of the valve to the stem. Then some valves were made with the head both threaded and welded to the stem; some with a cast-iron head and a steel stem, or a cast-iron ring forced over the outer circumference of the head. In 1906 a nickel alloy steel was developed and found suitable for use in valves, but it was not until 1916 that the first one-piece valve was made by a forging process. Practically all valves today are made by this forging method. With the increasing number of new alloy steels, having improved physical properties, and being heat resistant and corrosion resistant to a marked degree, a wide field has been opened for the selection of suitable valve steel.

As a result of war research, in 1920, the first silicon-chromium steel or silchrome steel as it is called, was introduced. It was found to be excellent valve steel but difficult to work satisfactorily. However, grinding and machining problems soon were solved and silicon-chromium became an accepted valve steel.

With the development of the airplane, new service demands were made upon valves. Originally about 50 hours service was specified for airplane motor valves. When the Thompson company developed the first silicon-chromium airplane valve and tests showed it still in good condition after 387 hours of continual service, the test limit was raised by the government to 300 hours where it now stands.

Other alloy steels since have been found suitable for valve manufacture under the modern test requirements. Present practice at the Thompson plant calls for silicon chromium steel to be used in all automotive exhaust valves manufactured. Analysis of this steel runs about 3 to 4 per cent carbon and 7 to 10 per cent chromium.

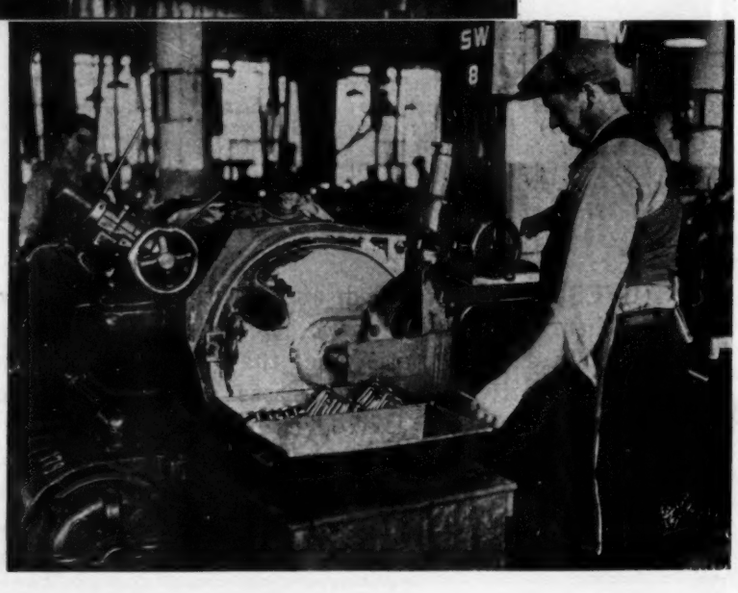
Other Standard Steels Used

Automotive intake valves are fabricated from a special steel, S. A. E. steel 3140, and a few from 6150. A chromium-nickel-silicon steel known as C. N. S. steel is being used for most

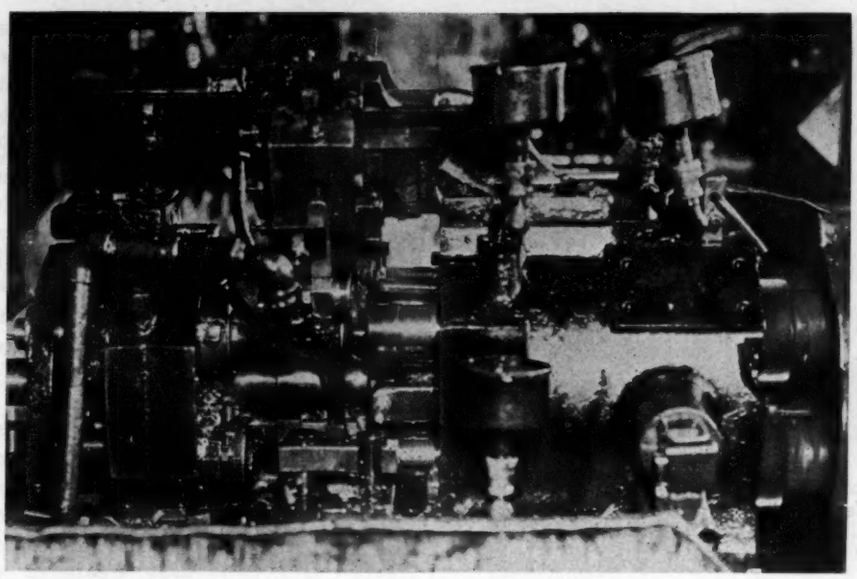
(Left) Quenching the hot valves following one of the heat treating operations. The fork used to lift the valves will hold eight pieces

(Right) Automatic upsetting machine. The hot valves descend the inclined trough, fall into the die in a horizontal position, and the head is upset

(Below) One of the finish grinding operations on the valve stem, performed on a centerless grinder. The head of the valve may be discerned through the stream of coolant in the center of the illustration



aircraft exhaust valves. This steel is corrosion resistant, has high strength at heat and will not harden. Due to the fact that the steel will not harden, practice has been to force a hardened tip in the end of the stem so that wear may be minimized. The steel is austenitic with chromium running from 11 to 15 per cent, nickel 7 to 9 per cent and silicon 2 to 3 per cent. A high tungsten steel, S. A. E. 71360, generally is used for aircraft intake valves and some exhaust valves, in addition to a cobalt-chromim steel, PRK-33, an English steel which is used for a few exhaust valves for aircraft power plants. The cobalt-chromium steel is heat resistant and has high tensile strength and good impact values.



Four-spindle automatic machine performing rough machining operations on automobile engine valves

The alloy steels used by the company are purchased from various manufacturers of alloy steel. In 1929 Thompson Products Inc. requisitioned about 3600 tons of steel for valves. The company also makes pistons, piston pins, drag links, tie rods and bolts, some 400 tons of steel being used last year in the manufacture of bolts. These products are manufactured in other plants of the Thompson Products organization, located at 2900 Detroit and 2301 Scranton in Cleveland, and 7881 Conant in Detroit.

Careful Analysis Practiced

It is the practice at the plant to analyze carefully each lot of steel which is purchased, especially steel to be used in aircraft valves. Aircraft steel is bought in the form of round bars ranging in diameter from ¾-inch and ⅞-inch to 1 inch. Automobile valve steel is bought in stem sizes ranging from 23/64-inch to 1 inch. Each heat is kept separate and every bar is inspected carefully for out-of-round, seams, pitted surface and other possible defects. Each bar of aircraft steel is etched throughout the entire length and inspected before being used. A slug is cut from each end of the bar, etched and inspected for segregation and roll defects, following which the slug is hardened and broken and the fracture re-inspected.

The manufacture of aircraft valves is particularly interesting due to the care which is exercised and the many precision operations through which each valve is put. Illustrative of aircraft valves are two types of Wright engine valves, made by the Thompson company, one being the older type valve for the J-5 engine and the other a newly designed valve for the J-6 engine.

Stem Filled With Salt

Adequate cooling of the parts in the J-5 motor which operated at high temperature was accomplished by the use of a hollow-stem valve, the cavity being half filled with a mixture of potassium and lithium nitrate. As the valve became hot, this mixture melted, and the resultant splashing within the stem aided in the conduction of heat from the head of the valve down through the stem where it could be carried away by the valve guides.

However, the newer J-6 motor has been designed in such a manner that valves operate at lower temperatures and the use of a salt-filled valve, which embodied many difficulties in manufacture, was eliminated. The new valve is decidedly stronger structurally and is more foolproof that the older type. The most distinguishing feature is a deeply cupped head, resembling the flower of a tulip. For the want of a better descriptive name, the valve has been called a tulip valve. About the head there is a reinforcing ring. The stem is large and drilled in such a manner that the hole within the stem tapers at the end and is closed at the neck.

With the incorporation of the tulip head many advantages were obtained. Steel is bound to be much stronger when submitted to tensile forces than when acted upon by shearing or transverse forces. With a deeply - cupped head the valve figuratively is hung in its seat, lines of force following along the radius of the cup to converge at the stem. This, experiments have proved, affords a much stronger valve than when the stem and head are joined at high angles. It also has been demonstrated that the properly designed tulip valve runs cooler in an engine than one which is slightly cupped or which has a flat head. Engineers theorize that the cup collects a layer of inert gases; thus, when the cylinder fires, the valve is partially protected by this insulating layer from the sheet of flame which sweeps across a flat-head valve.

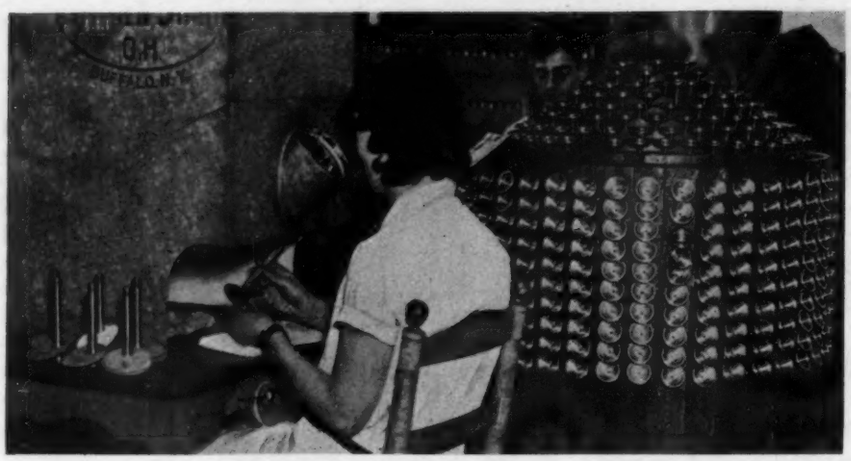
Another interesting contention which comprehensive tests seem to bear out concerns a resilient property of the cup head. As the valve is snapped down to its seat, it tends first to pucker and then spring back, affording tighter contact with better sealing. The reinforcing ring about the head of the valve provides proper resiliency and prevents warping or buckling.

Stem Design Important

A number of important considerations enter into correct design and construction of the valve stem. It must be large enough to conduct sufficient heat to the cooling media surrounding the guide. It also must be of such section that it has sufficient strength at the temperature of operation to resist repeated stress caused by opening and closing at high speeds.

In the case of the Wright J-6 valve, the stem is characterized by a large cross section, resulting in an increase in heat conducting area. Lightness, reducing total weight and the tendency for seat battering, is obtained by drilling the stem. The neck section is strengthened by tapering the hollow at that point, thus providing sufficient metal to insure strength without encumbering the valve with excess metal.

The manufacturing sequence for the



Final inspection under magnifying glass on airplane engine valves. At the right is the "christmas tree" used to transport the finished valves about the plant

Wright J-6 valve is typical of all airplane engine valves and illustrates the high degree of precision and inspection carried out on each piece. The round bars are hot sheared on small punch presses, eight of which are operated in this department. Stock is heated to 1400 degrees Fahr. in a gas-fired box-type furnace, about 2 or 3 feet of the length of a bar being heated at one time. All heating operations at the plant are under the supervision of a heating inspector who checks temperatures with an optical pyrometer.

Following the shearing operation the parts are preheated to 1600 degrees Fahr. and then heated to 2200 degrees Fahr.; then they are transferred to 2½-inch headers built by the National Machinery Co., Tiffin, Ohio. Nine of these headers have been installed for upsetting operations. Each header contains three dies. The first die gathers some of the stock at the end of the bar, the second die carries the gathering operation further and the third die upsets this gathered end. The headers also stamp the part number on the valve while in the machine.

The next operation is to gather the opposite end of the stem, to provide metal for extrusion. This operation also is carried out on headers at a heat of 2200 degrees Fahr.

Annealed to Remove Stains

The parts then are annealed to soften them for machining and to remove any strains which might have been developed in upsetting. They are then placed in monel metal baskets, each of which has a capacity of about 1000 pieces, and pickled in sulphuric acid for one hour at 180 degrees Fahr.

Following the pickling treatment the parts are placed in tote pans and conveyed to the machining department. The first machining operation is to grind the valve shoulder. The heads are then centered and machined on turret lathes built by the Warner & Swasey Co., Cleveland, following which the heads and stems are rough ground. Grinding and tapering the seat is the next operation, following which the valve is transferred to another turret lathe where the stem is drilled, leaving a tapered hole.

End Closed on Header

After the stem drilling follows an interesting process of closing the end of the stem. This is carried out on header machines. The valve is placed in the die of the header with the gathered end of the stem projecting. The ram then forces this projecting end through the die and the metal on the end of the stem in reality is extruded and the hole at the end of the stem completely closed. On some of the valves this drilling and extruding is carried out as many as three times, each time the drilling being of a smaller diameter. This is done in order to close securely the end of the stem.

The valves next are subjected to an annealing treatment and then cut to length on a special machine known as a Radiac machine, employing a rubber bonded wheel. A rough inspection then follows, dimensions being checked by dial indicators made by the B. C. Ames Co., Waltham, Mass.

The heads and stems then are rough ground after which follows a necking operation which consists in machining the two grooves at the end of the valve stem. This operation is done rough on turret lathes. The valves then are machined to length and the top of the head is machined and cupped; they then are put through the rough seating operation. These machining operations all are carried out on previously mentioned turret lathes, about 60 of which are operated in the machining department.

The valves then are conveyed to a special type of grinding machine manufactured by Brown & Sharpe Mfg. Co., Providence, R. I., which grinds the top of the head. The heads are polished by hand, stamped and the entire valve heated in a box-type furnace, a product of General Electric Co., Schenectady, N. Y. The valves are put in this furnace in a vertical position, resting on the head, a specially designed fork which accommodates about eight valves at a time being used for charging. Following the heat treatment the valves are oil quenched from 1450 degrees Fahr., spotted and scleroscoped and indicated for warpages, dial indicators being used again.

The stem is now rough ground twice; the first grinding reduces the diameter by 0.017 inch while the second grinding reduces the diameter by 0.010 inch. A number of precision grinding operations follow. Correct diameter of the head is obtained by grinding the edge of the head, the valve is ground under the head, the tip end is ground, a scleroscope check is run, the chamfer on the end of the stem is ground and the first finish grind on the stem is carried out, reducing the diameter by 0.006 inch.

Neck and Seat Ground

Next a rough and finish grind on the neck is carried out followed by a rough and finish grind on the seat. A finish grind on the stem is performed on centerless grinders built by Cincinnati Grinders Inc., Cincinnati. Then ensues a careful inspection for size and straightness; also the radius of the neck is checked on a comparator. The valve is placed in the comparator and a light projects from behind the valve through a 50-diameter magnification and upon a ground glass screen. Thus the radius of the neck is actually magnified 50 times and the shadow thrown upon this screen where it is checked by noting whether it is within a certain series of lines etched upon the screen Inspectors are maintained at all machines to check all dimensions at all operations.

The valves now are etched in a 25 per cent solution of aqua regia, dried thoroughly and drawn in a Homo-type

(*Concluded on Page* 47)

German Designers Conceive Large Machine Tool Units

Electrification of Industry and Combination of Machining Operations Result in Massive Designs

By S. Weil

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POSTWAR depressions which have swept the German industries again and again have not affected the manufacturer of large machine tools nearly to the degree that the attendant shortage of money and the consequent difficulty in procuring amounts required for the construction of large machine tools was supposed to affect them.

It has been possible not only to maintain the prewar size of machine tools but to go far beyond it. Reasons for this trend are numerous. The ever increasing electrification of all phases of industry has necessitated electrical power plants and equipment of undreamed magnitude. The increase in tonnage and size of ships has required driving units of large proportions, for the manufacture of which machine tools of exceptional capacities were required. To keep abreast of the demand for large machine tools for such massive parts as the housings for water turbines, bedplates of turbogenerator units, flywheels, rotors, etc., the German machine tool designer has been called upon for intensive effort. The leading trend in both revamped old designs and new methods has been the extensive use of electricity, resulting in manifest improvements in simplification of construction and ease of manipulation, which together have made for higher output. Steam drives for large machine tools such as heavy-duty shears, punching and bending machines have been eliminated entirely in preference to the more convenient electric drive. The same may be said for the method of drive from mainshafts. Flywheels as

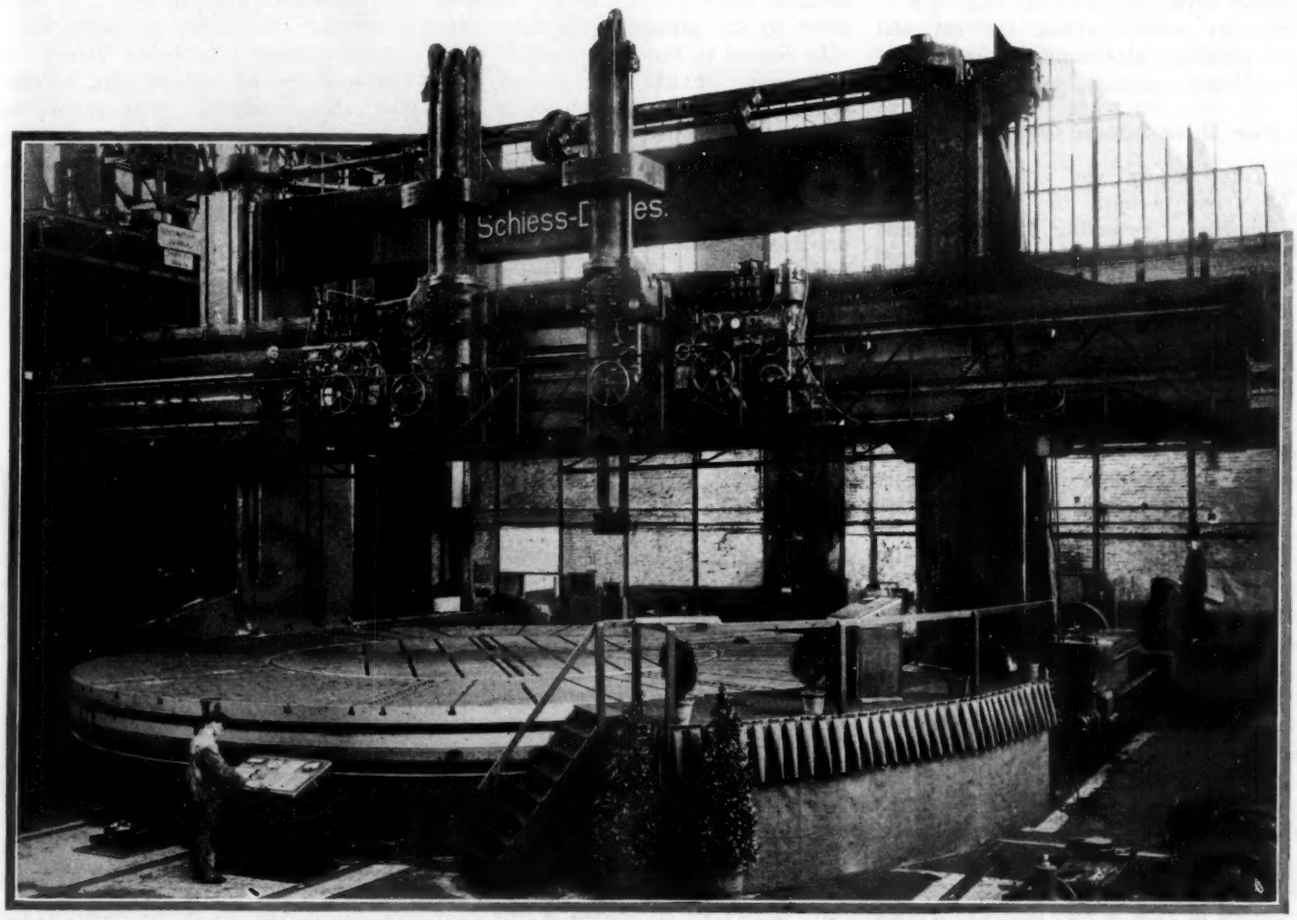


Fig. 1—Large turning and boring mill for machining parts of water turbines, and turning rotors, dynamo or motor housings, flywheels, cylinders, etc.

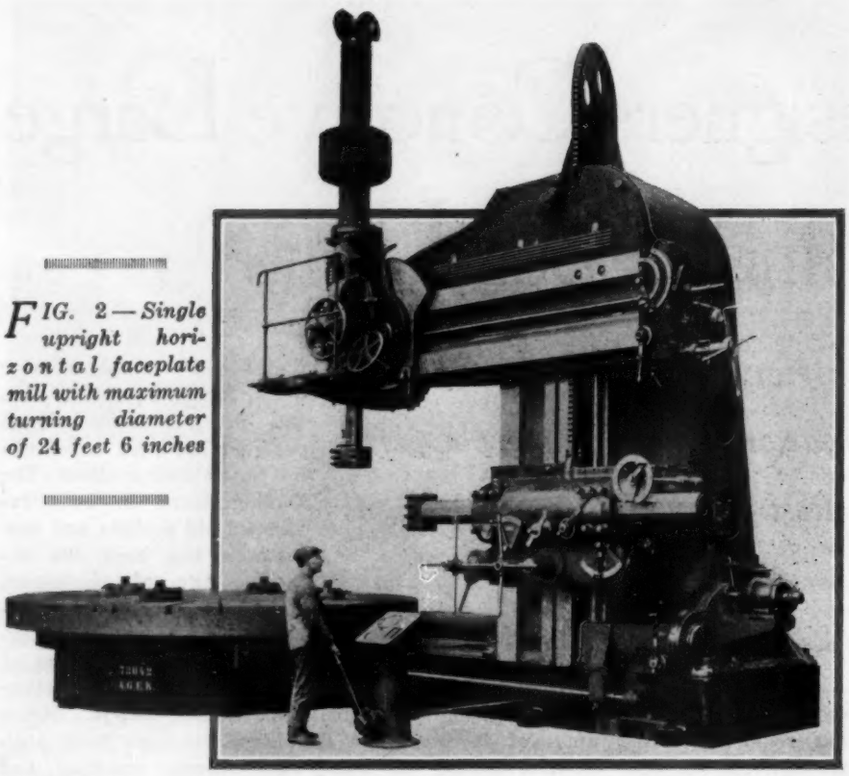


FIG. 2—Single upright horizontal faceplate mill with maximum turning diameter of 24 feet 6 inches

energy accumulators, formerly supplied with all heavy plate shear drives, have been superseded by the direct, electrically-controlled and operated power drive, requiring no engaging of clutches when starting the cut and no shearing pin couplings for releasing kinetic energy.

New Drive System Gives Flexibility

This modern and convenient type of drive permits the instantaneous stopping or reversing of motions and the automatic adjustment of the speed of cutting to the resistance offered by the material; thus, the thickness, hardness and toughness of the plate are brought in direct relation to the cutting speed. Hydraulically-operated machine tools are being replaced constantly by those employing electric power. Electric power, although involving possibly a more complicated mechanism, is regarded as more reliable, cleaner and having a greater capacity for adaptation to the various demands of modern machine tools.

The rearrangement and improvement of main drives logically has led to a like improvement of auxiliary drives and attachments. Quick power adjustment, power feed and limit switches are integral parts of modern German tools. Tool boxes of giant portal milling machines, for instance, are equipped with independent motors for both driving and feeding, connected in such a way that the feeding motor is cut out automatically if for some reason the motor driving the tool should stop. Another notable feature in this connection is the application of pushbutton control, permitting the operator to control his machine from practically any desired point, by the pressure of a finger tip.

In regard to the most suitable type of current, it has been found that alternating current undoubtedly has the cheaper source as it can be obtained readily by direct connection with a central power station. For small machines and the simpler medium-sized units alternating current finds preference, although necessitating the provision of a change gear box. However, with the large machine tools direct current is the more convenient and in fact the only type of current that will perform the many operations involved with the least amount of supplementary equipment. Adjustment of speed at will plays a considerable role in economy and output, and although adjustable-speed alternating-current motors are available, their high price and other shortcomings make the installation of a rotary converter and the generation of direct current the better policy.

Employe Comfort Considered

Comfort of the operator and ease of manipulation are two factors which have received considerable attention in modern German design. Operators' platforms are provided and on traveling tool boxes such as found on large size monopillar boring and milling machines, heavy-duty portal milling machines, large horizontal faceplate lathes, etc., these platforms form integral parts of the moving assembly and permit the operator to be in constant proximity to the tool. Some of the largest horizontal faceplate lathes have a runway extending the full length of the crosshead. All operating levers and handwheels are arranged in such a way that they may be reached conveniently by the workers.

Greater stress is being placed on the provision of suitable and reliable lubricating systems. With regard to lubrication, large machine tools are more vulnerable to any inefficiency in this respect than smaller types and the consequences of a breakdown occasioned by lubrication failure are more serious. In appreciation of this

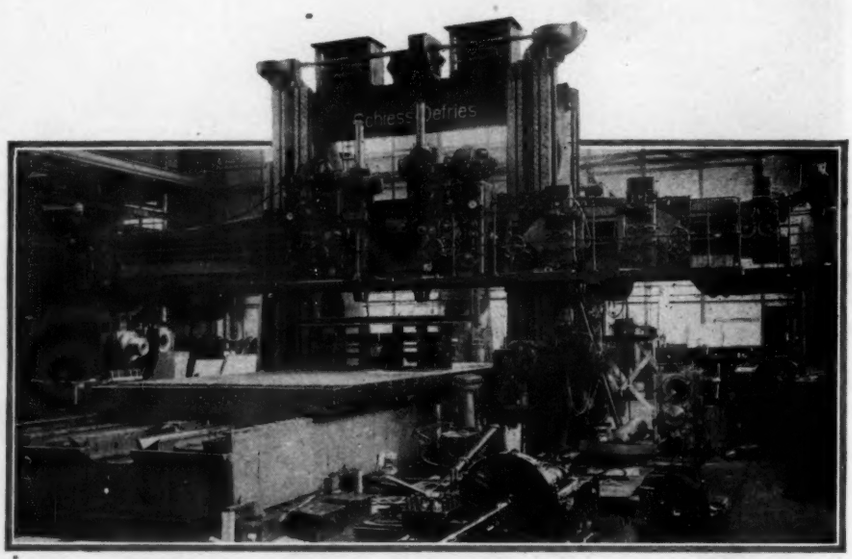


Fig. 3—Large planer fitted with milling heads on the crosshead. This machine will accommodate work 26 feet long, 13½ feet wide and 11 feet 10 inches high

fact the layout of oil tanks and oil supply pipes and tubes no longer is left to the shop man but is treated as an integral part of the designer's work. Use of centralized lubrication systems has done away to a large extent with the human factor in lubrication. Easily reached oil reservoirs supply the lubricant through drip lubricators to any and all places where it is required. All power transmission gears are supplied with a constant stream of oil directed at the meshing teeth, thus acting as both a lubricant and coolant. Formerly, planer table and the annular bearings of faceplates had lubricant supplied by rollers placed in oil-filled recesses of their ways. This method has been abandoned in favor of pumping oil under pressure between the sliding faces.

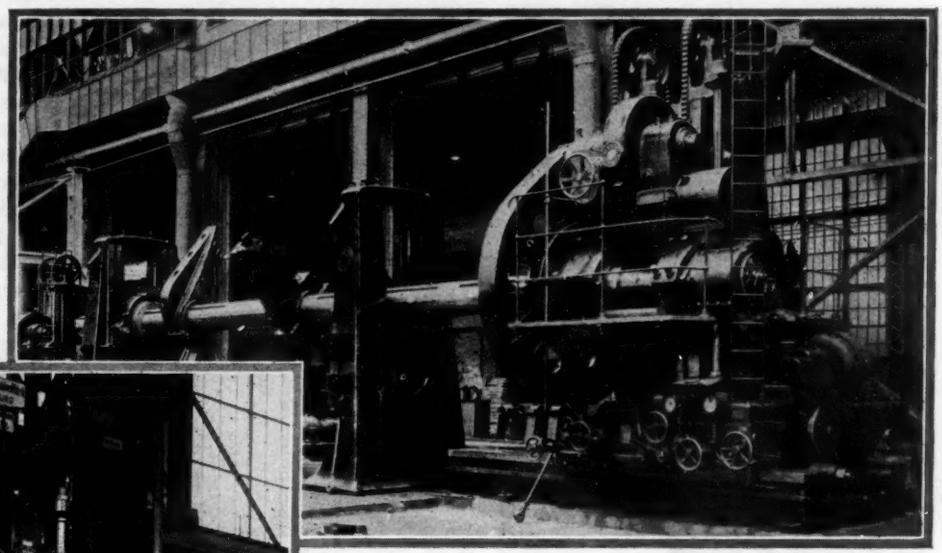
High-speed cutting tools also have revolutionized considerably machine tool design and lathes now are being built to be operated at speeds as high as 655 feet or more per minute.

Instantaneous Action Required

Speeds of this magnitude require accurate and instantaneous action of all moving parts. For this reason controls have been centralized at the operator's platform and tachometers provided conveniently to indicate velocities of faceplates, drilling spindles and milling spindles. This provides an accessibility which speeds up all processes.

A decided improvement has been registered in the demand for grinding machines and a number of grinders have been built for such heavy-duty work as finish grinding main propeller shafts up to 30 feet in length. Improvements in design have not been confined to circular grinders but in addition, progress has been made in surface grinders with both vertically and horizontally posed grinding wheel spindles. Although many designers contend that table travel and wheel feed are operated best by hydraulic methods, some engineers hold a less favorable opinion of the superiority of these methods. Universal acceptance of magnetic chucking on surface grinders employing vertical spindles and revolving tables is apparent.

A pronounced feature of large machine tool design in Germany is the tendency to combine two or more machining operations in one machine, in an attempt to obtain as nearly as possible full-time use of the machine and thus make its purchase a better investment. Large horizontal faceplate lathes and planers thus have been equipped with milling and drilling heads, designed not as temporary attachments but as efficient, high-speed auxiliaries. In like manner, tool boxes of faceplate mills often are adapted for carrying out keywaying operations and toolposts of planers fitted with grinding attachments. Another reason for the use of semiuniversal machine tools is seen in the fact that it is always more economical to perform as many operations as possible in one setup, in place of transferring the work and resetting it; especially when the piece is of complicated shape and weighs up to 20 tons or more.



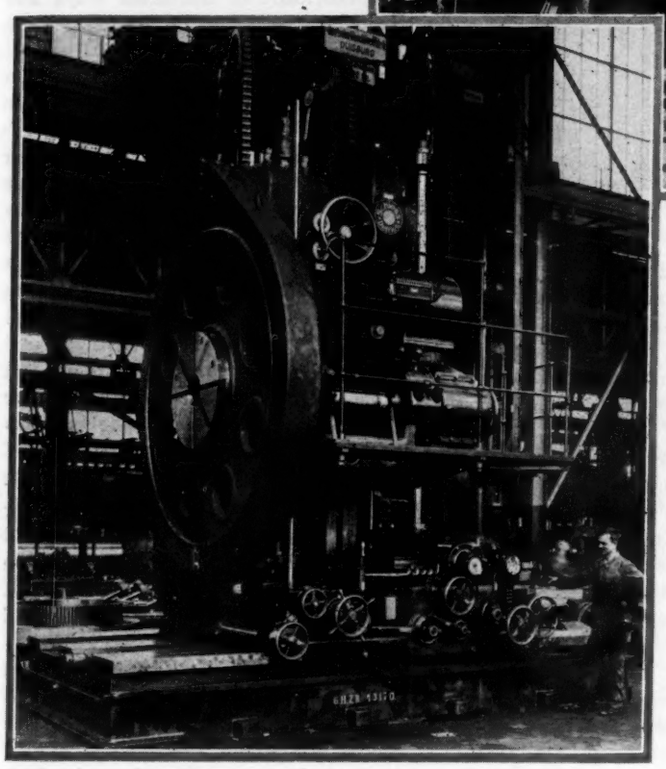


FIG. 4 — Two views of large cylinder boring mill employing bars up to 24 inches in diameter and 65½ feet in length

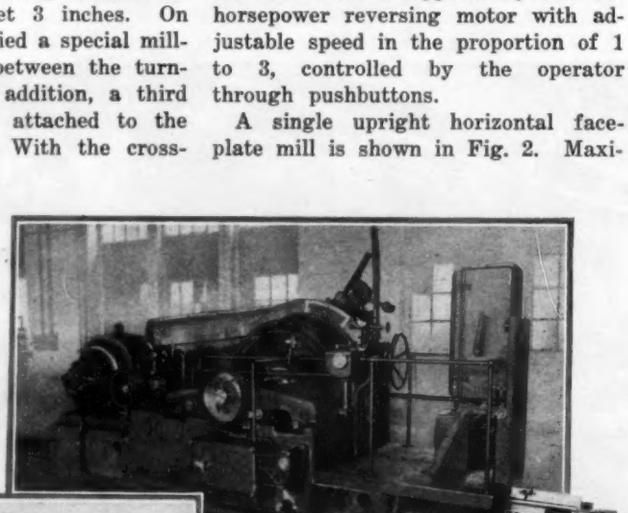
Obsolescence An Important Factor

It is easily understandable that since the acquisition of large machine tools requires the investment of considerable capital, it follows that the designer of such machines must take into account the factor of obsolescence to a much greater degree than in the design of standard smaller machine tools with which the capital invested is written off within a few years. It has been interesting to note that the manufacturer of large machine tools in Germany has been cognizant of this fact. Proof is found in that some of the earliest horizontal faceplate lathes constructed in Germany at the beginning of this century, having a faceplate diameter of 24 feet 6 inches, stand up to the modern high-speed cutting tool without requiring any changes in construction other than the substitution of a higher powered motor.

Interesting though it might be, it is outside the scope of this article to

enter into a description of constructional details of any of these large tools. However, a brief description of some of the salient features of a few of the large machines is not amiss.

Illustrated in Fig. 1 is a large turning and boring mill, capable of machining material having a maximum dimension of 26 feet 3 inches. On the crosshead is carried a special milling head arranged between the turning tool boxes. In addition, a third turning tool box is attached to the right-hand upright. With the cross-



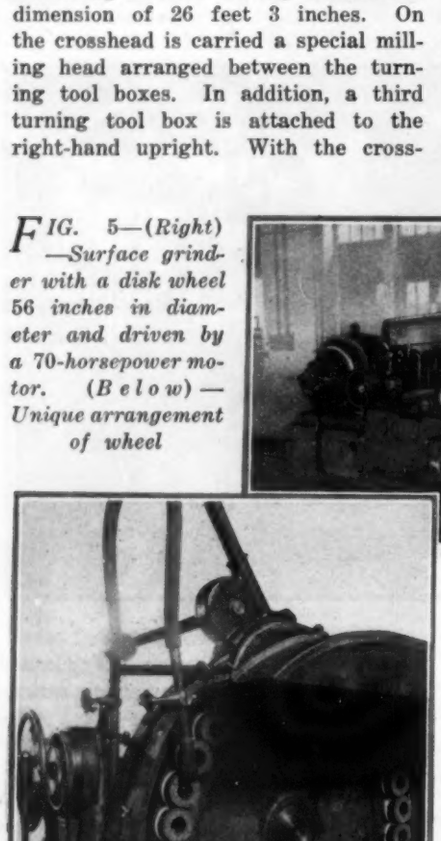


FIG. 5—(Right) —Surface grinder with a disk wheel 56 inches in diameter and driven by a 70-horsepower motor. (Below) — Unique arrangement of wheel

head tool boxes at extreme ends and the one on the upright below faceplate level a maximum turning diameter of 27 feet 3 inches may be obtained.

The faceplate is conveniently provided with hand and power-operated fine adjustment. The left-hand turning tool box on the cross slide may be used for keywaying large flywheels or similar work. For this type of job the reciprocating speed of the toolpost is superior to that of the quick power adjustment. As in the case of planers, change of direction is obtained automatically by adjustable dogs.

Auxiliary Heads Provided

The milling head has its own independent motor, 12-horsepower in capacity, and is provided with a universal drilling head permitting vertical and horizontal drilling. A special pitching gear facilitates accurate pitching of the faceplate when drilling pitched holes or notches. The mill is intended for machining parts of water turbines but can be used with equal advantage for turning rotors, dynamo or motor housings, flywheels, cylinders, etc. Power is supplied by an 18-horsepower reversing motor with adjustable speed in the proportion of 1 to 3, controlled by the operator through pushbuttons.

A single upright horizontal faceplate mill is shown in Fig. 2. Maximum turning diameter is 24 feet 6 inches. A 7-horsepower motor provides power for traversing the pillar. Faceplate diameter is 15 feet; the plate revolves in a V-shaped annular groove one side of which is vertical in order to take up horizontal reactions. A 60-horsepower drive motor is furnished, of the adjustable speed and reversing type. Balancing of toolposts in German faceplate lathes is accomplished universally by counterweights arranged on the tool box and not by weights suspended in the rear at one or both sides of the machine and necessitating the use of chains or wire cables extending over almost the entire length of the crosshead.

Combined Machines Popular

A typical example of a large combined machine is shown in Fig. 3, a planer fitted with milling heads on the crosshead. Work 26 feet long, 13½ feet wide and 11 feet 10 inches high will pass between the uprights and beneath the crosshead. This powerful tool, with two planing tools and two milling heads on the crosshead in addition to a third planing tool on the left-hand upright, may be used to equal advantage on planing and milling operations. All tools are independent in regard to feed or power adjustment. Each head has its own motor for feed and power adjustment, permitting a maximum feed of 4 inches for each stroke of the table. Provision has been made for automatic quick traverse over those portions of the stroke where no machining is required.

No fewer than 11 motors are required in the operation of this machine. A 70 to 130-horsepower reversing adjustable-speed motor furnishes a table cutting speed of 23 to 59 feet per minute and a return speed of 59 to 91 feet per minute. A 20-horsepower motor provides for the vertical traverse of the crosshead; a 20-horsepower motor is used on each milling head; and two motors are mounted on each planing tool box, one for furnishing the feed motion and the other for returning the tool on the return stroke. The other motor is used for driving the pump which supplies lubricant to the table ways and lubricates the gears on the table drive mechanism.

Motions Are Interlocked

All principal motors are pushbutton controlled. Automatic locking devices make it impossible to engage the planing motion when milling and vice versa. The planing motion works on a rack and pinion drive while the milling motion is through spindle and screw. Large turbine casings and similar parts requiring planing and facing are among the chief items for which this combination machine has been designed.

Another ingenious design is illustrated in Fig. 4, a cylinder boring mill. Heavy boring bars up to 24 inches in diameter and 65½ feet in length, supported by strongly built steadies and fitted with double-armed tool slides, permit machining cylinders and casings used in the construction of modern power plant units. The pillar carrying the headstock with spindle, to which the boring bar is attached, is traversible along its bedplate. Power is furnished by a 50-horsepower motor.

The surface grinder shown in Fig. 5 has a disk wheel 56 inches in diameter and is operated by a 70-horsepower motor. The work is fastened to stationary supports in front of the disk wheel, the latter carrying out the reciprocal motions. The arrangement of the abrasive disks is illustrated also in Fig. 5. Feed advance and reciprocation of the wheel are done hydraulically, pressure being supplied by an oil pressure pump. Control is manipulated from the platform attached to the wheel carrier slide.

Domestic Manganese Ore Shipments Increase

An increase of about 30 per cent is reported in shipments of manganese ore, containing 35 per cent or more of metallic manganese, from domestic mines in 1929. The shipments totaled approximately 61,000 gross tons, valued at $1,926,000, compared with 46,860 gross tons, valued at $1,214,853 in 1928, according to the bureau of mines. Shipments of metallurgical ore in 1929 amounted to about 48,000 gross tons, valued at $1,380,000, compared with 31,430 gross tons, valued at $593,561 in 1928, while chemical ore shipments decreased from 15,430 gross tons, valued at $621,292 in 1928, to about 13,000 gross tons, valued at $546,000 in 1929.

The relatively large increase in 1929 was due mainly to the increased output from the plant of the Domestic Manganese & Development Co., at Butte, Mont. This company treated in its mill about 50,000 gross tons of rhodochrosite averaging 37.6 per cent of manganese from which was produced about 30,000 gross tons of sinter averaging 57.7 per cent of manganese.

During the first 11 months of 1929 the United States imported 630,083 gross tons of ore containing 308,113 gross tons of metallic manganese. Assuming that the imports for December were at the same rate as in November, the total tonnage imported would be approximately 680,000 gross tons containing 332,000 gross tons of metallic manganese, compared with 427,708 gross tons of ore containing 207,808 tons of metallic manganese during 1928. Imports from Soviet Russia for the first 11 months amounted to 328,861 gross tons of ore containing 168,874 gross tons of metallic manganese, compared with 159,842 gross tons containing 79,529 tons of metallic manganese in the entire year of 1928.

Plaster Models Used To Determine Stresses

The plaster-model method of determining stresses applied to curved beams is described in detail in bulletin 195 of the engineering experiment station of the University of Illinois, Urbana, Ill. This 34-page booklet was prepared by Fred B. Seeley, professor of theoretical and applied mechanics, and Richard V. James, graduate student in theoretical and applied mechanics, both of the university. By extensive research and computations, the authors discover that pottery plaster, if properly cured and dried, has approximately a straight stress-strain diagram up to the ultimate breaking stress; its behavior up to rupture, therefore, being approximately the same as the elastic behavior of a ductile metal such as steel. Results of their tests on these plaster specimens of curved beams, together with numerous illustrations and drawings are presented in the bulletin.

Plan Advanced Work at Carnegie Institute

Graduate courses leading to the doctor's degree in metallurgy will be offered by the department of mining and metallurgy at the Carnegie Institute of Technology beginning next fall. The announcement marks a new departure in the policy of Carnegie inasmuch as the graduate work now being given leads only to the master's degree. The plan to give advanced work is the natural outgrowth of the program of research in steel and coal that has been projected by the institution.

The proposed advanced study program will include such courses as advanced metallurgy of iron and steel, corrosion of metals, advanced X-ray analysis, advanced electrochemistry and electrometallurgy, economic metallurgy, plant problems, refractories, physical chemistry of iron and steel making, metallurgical design, and advanced testing of materials.

Alloy Steel Important in Valve Manufacture

(*Concluded from Page* 42)

furnace at 500 degrees Fahr. for 20 minutes to remove all traces of hydrogen. They are then buffed over the entire surface on a cotton buff, washed in a solution known as Dearboline, and inspected under magnifying glasses and binoculars, at a magnification of 40 diameters. The final polish is a mirror finish obtained by a special type of emery cloth. A final inspection is carried out to insure against the presence of any cracks or scratches. Inspectors' numbers are etched into the tops of the valves by an electric pencil. The valves are slushed in oil, wrapped in paper and packed in suitable boxes for shipping.

From this lengthy series of operations it is seen that utmost care is taken in production of airplane valves, but these valves are necessarily a quality product and must be unceasingly inspected. Summing up some of the grinding operations it is noted that there are six grinds under the stem and four separate grinding operations on the head, all of which are done carefully to gages. As noted previously, a hardened steel plug, made of cobalt-chromium steel, is forced into the end of the valve stem. This is a separate operation and consists in drilling the end of the stem and carefully grinding the hole to size, then forcing in the steel plug. The end is then ground carefully to insure the plug being flush with the end of the valve stem. The valves are carried about the plant in tote pans and trays. The trays or "Christmas trees" as they are called are used only for the finished valves.

It will be recalled that some of the stock is purchased in stem sizes and started through the operations without any preliminary treatment. However, on some of the larger sizes the stock used is somewhat larger than the finished stem size and therefore is subjected to a preliminary hammering treatment. This is done on 150-pound motor-driven hammers manufactured by C. C. Bradley & Son Inc., Syracuse, N. Y. These hammers, ten of which are operated by the company, deliver about 150 to 200 blows per minute. Two operators are stationed at each hammer. One transfers a heated piece from the furnace to the hammer while the other handles the piece in the hammer turning it about so that the blows of the hammer will be applied to all parts of the surface. When a part is put through this hammering process the entire length is not hammered down, a section of about two inches being left at one end, of the original diameter. This eliminates the necessity for gathering the neck end of the stem to provide metal for the extrusion operation. Thus it is seen that the smaller sizes go directly to the upsetters while the larger size stems first are hammered down to the stem size.

Other Valves Made Similarly

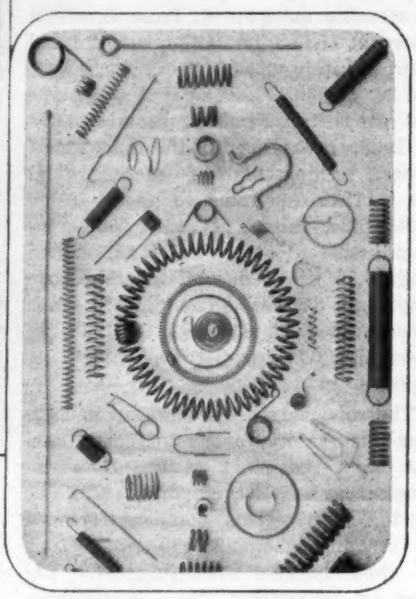
Automotive valves follow through a similar series of operations but the high degree of precision and careful inspection is not so urgent on this type of valve. Many of the operations which are performed on turret lathes for airplane valves are accomplished on automatic lathes for automotive valves, thus facilitating speedier production and entailing less manual attention.

All tools and dies used in the plant are repaired and serviced by a department devoted exclusively to this work.

Coil springs are placed in a holder and both ends ground at the same time in a double disk grinder

160th Article

Springs



Large Uses of Steel In Small Ways

APPROXIMATELY a half-million tons of steel is consumed annually in the United States in the manufacture of springs. A leading producer estimates the total as 480,000 tons, classifying it as follows: Elliptic springs, such as used in automobiles, 100,000 tons; large springs of the type used in railroad cars and coaches and urban and interurban electric cars, 250,000 tons; springs used in upholstery of automobiles 30,000 tons, and springs of miscellaneous sizes and shapes for various other requirements, 100,000 tons.

Springs Highly Important

Springs play a highly important part in the mechanics of modern life, yet few people appreciate how closely springs are associated with the innumerable articles which contribute to their comfort or convenience. We wake up in the morning at the command of a spring-driven clock, making sure of the time by comparing the clock with our spring-driven watch, and whether we ride in an automobile or street cars, the ride is made possible and comfortable by means of springs.

The devices used to regulate the temperature of our offices, to close doors behind us, the machinery in which manufactured products are made, depend on springs for proper functioning. At home the radio, the phonograph, electric refrigerator, washing machine, vacuum cleaner and practically every labor-saving device has springs in it somewhere. At the end of the day we go to sleep on a mattress supported on springs. This article is written on a typewriter which has 60 springs in its mechanism. The upholstery in the average automobile contains 12 to 15 pounds of steel in the form of springs, which on the basis of 4,586,000 passenger cars as in 1929 gives a total close to 30,000 tons.

THIS is the one hundred sixtieth of a series of articles dealing with some of the obscure uses of steel which go far toward absorbing the American tonnage.

Among articles appearing every two weeks and not included in Vol. I containing 51 separate descriptions are:

Wire Lamp Shades	*Washing Machines*
Belt Fasteners	*Resilient Road Guards*
Sap Spouts	*Screw Drivers*
Flexible Conductors	*Windows*
Foundry Flasks	*Car and Bus Seats*
Teletype Machines	*Bathroom Cabinets*
Porch Furniture	*Lock Washers*
Telegraph Wire	*Steel Scaffolding*
Waste Receptacles	*Pavement Armor*
Chain Screens	*Torches*
Louvred Ventilators	*Ironing Machines*
Universal Joints	*Ball Bearings*
Rolling Doors and Shutters	
Messenger Call Boxes	*Telephone Booths*
Foot Guards	

Production Requires Special Machinery

Production of high-grade springs requires special machinery, special heat-treating equipment with accurate temperature controlling devices, a high degree of skill in the selection and use of materials, careful testing and inspection. Many grades of steel are used, but by far the greater tonnage is a plain carbon steel containing about 0.9 to 1.0 per cent carbon for those springs which are made of stock ½-inch or larger, and a drawn wire containing about 0.5 per cent carbon for the smaller sizes. The latter is given a spring quality by drawing through dies, without subsequent heat treatment. A smaller tonnage of carbon steel drawn to size then quenched and tempered, is used for commercial springs of higher grade.

A considerable tonnage of alloy

(*Concluded on Page* 62)

Manganiferous Carbonate Is Potential Reserve

Recent explorations under private auspices have revealed a bed of shale containing manganiferous iron carbonate nodules for many miles along the valley of the Missouri river in south-central South Dakota. An examination of the central part of the area was made by D. F. Hewett, a geologist of the geological survey. His report indicates the quantity of manganese metal contained in the 38-foot horizontal bed of concretions is much larger both per unit of area and as a whole than is known in most localities where manganese minerals occur in definite beds, but the quantity of manganese per cubic yard of shale is much lower than in any material thus far treated as a source of manganese.

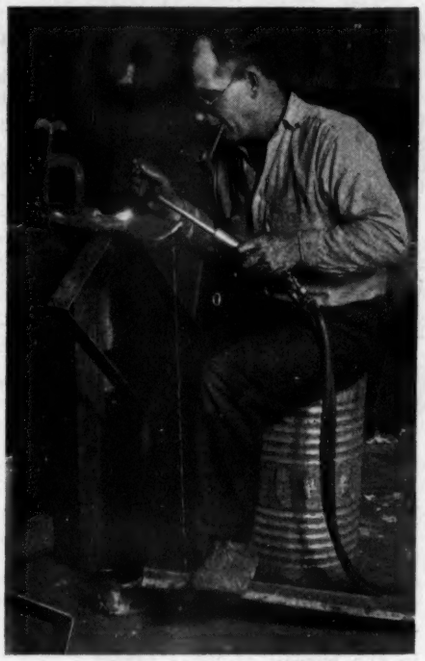
The total quantity is estimated to be about 100,000,000 tons. The manganese content of the concretions in the entire bed probably averages about 25 pounds per cubic yard of shale, which if converted to a high-grade product for smelting to ferromanganese would be worth at present prices about 60 cents or 2.4 cents per pound of manganese. The data indicate that the richest 10-foot zone, 26 per cent of the total volume, contains about 36,000,000 tons, or about 36 per cent of the manganese. Material estimated to contain about 15,000,000 tons of manganese could probably be received from this 10-foot zone. Most of this material lies within four miles of a railroad. Hewett reports it does not seem justifiable at present to include the material in estimates of national reserves of manganiferous ores. Viewed as a national asset for an emergency, however, when cost of treatment is a secondary element, it deserves consideration.

Steel Oxides Determined by New Method

A new method for the determination of ferrous oxide in liquid steel has been devised by the Pittsburgh experiment station, bureau of mines, in co-operation with Carnegie Institute of Technology and the metallurgical advisory board. The process consists briefly in killing a sample of liquid steel with an excess of aluminum and determining the alumina formed. The killing of the sample is done with heavy aluminum wire in the test spoon and not in the test mold. At the present time there are two generally accepted methods for determining iron oxide or oxygen in steel; reduction of the sample with hydrogen, the water vapor formed being weighed and calculated back as per cent of oxygen in the steel, and the vacuum fusion method.

Welding Jig Facilitates Foundry Assembly

ADOPTION of a simple welding jig by a manufacturer of flask bands for foundry use has done away with the necessity of installing expensive special equipment. The accompanying



Simple jig used in welding strip steel to make flask bands

illustration shows a welder using this jig while joining the flask band, which is nothing more than a strip of sheet steel bent in the form of a rectangle, the one open corner closed by welding. The bands are used in the foundry to bind together the wooden flask or box which holds the sand mold for a casting.

In welding the corner the band is held between two pieces of metal, short pieces of angle iron nested one into the other, turned upside down and clamped to the table. The heel of the upper angle has been coped out so that an oval hole is left. A simple treadle arrangement, consisting of a piece of steel wire and a bar, completes the fixture. The corner of the band to be welded is slipped between the two angles until it is opposite the hole. Then pressure on the treadle clamps it in place during the welding.

Research Paper Studies Iron Nitrogen System

New developments in the study of nitrided steel are announced by the bureau of standards in research paper No. 126 titled "Observations on the Iron-Nitrogen System," by S. Epstein, associate metallurgist; H. C. Cross, assistant metallurgist; E. C. Groesbeck, associate metallurgist; and I. J. Wymore, junior physicist, all of the bureau. In a study of the iron-nitrogen system thermal analyses, microscopic examinations and X-ray analyses were made of nitrided electrolytic iron specimens and the data compared with previous research. In general the results confirmed the reports of earlier investigators except that three iron nitride layers were observed, whereas only two had been previously noted. Two temperature horizontals were determined, but a microscopic examination indicated that the upper horizontal represented a peritectoid reaction, and not a eutectoid transformation as previously supposed.

Another new publication of the bureau of standards is research paper No. 124, "Comparative Properties of Wrought Iron Made by Hand Puddling and by the Aston Process," by Henry S. Rawdon, senior metallurgist of the bureau, and O. A. Knight, associate professor of metallurgy, Pennsylvania State college, State College, Pa. Results of this investigation were reviewed on Page 1562 of the Dec. 19 issue of IRON TRADE REVIEW.

These two publications may be obtained from the superintendent of documents, Washington, at a price of 30 cents for No. 124 and 20 cents for No. 126.

Plans Purchase of Large Testing Machine

Columbia university, New York, is negotiating for the purchase of a 3,000,000-pound testing machine for both tension and compression testing of steel, brick and concrete structural units, according to George B. Pegram, dean of the university's engineering school. The machine will involve the expenditure of approximately $50,000 and will be the largest of its type in this country. It will be housed in a new 14-story structure to be erected on the Columbia "green" at Amsterdam avenue and 120th street. The new testing unit will handle specimens up to 35 feet in length and will have a width under the loading head of more than 6 feet.

Federal Survey Shows Great Cut in Hours for Steel Labor

Average Full-time Hours Per Week in 1929 Was 54.6—Heavy Strain Lifted—Church Council Claims 26.9 Per Cent Still on Seven-day Week

Federal Council of Churches Says:

Of 248,247 employes in iron and steel plants:

Number of men on 8 hours	115,019	or 46.6 per cent
Number of men on 10 hours	110,698	or 44.6 per cent
Number of men on 11 hours	5,320	or 2.1 per cent
Number of men on 12 hours	16,610	or 6.7 per cent
Number on 5 to 5½-day week	51,234	or 20.6 per cent
Number on 6-day week	130,301	or 52.5 per cent
Number on 7-day week	66,712	or 26.9 per cent

Federal Bureau of Labor Statistics Says:

Average full-time hours per week:	1929	1922	Per cent Reduction
At blast furnaces	60.7	72.3	16.0
At open-hearth furnaces	57.7	70.8	18.5
At bessemer converters	53.7	68.7	21.8
At bar mills	55.6	61.2	9.1
Rail mills	56.0	61.5	8.9
Sheet mills	48.9	51.1	4.3
Tin plate mills	47.4	49.9	5.0
Puddling mills	50.3	52.1	3.5
Blooming mills	55.0	68.0	4.3
Plate mills	58.0	66.2	12.4

TWO investigations of hours of labor in the iron and steel industry were made in 1929. One was conducted by the bureau of labor statistics, department of commerce, Washington, and the other by two graduate students of Boston University School of Technology, working under direction of the Federal Council of the Churches of Christ in America, New York.

The federal bureau's survey was comprehensive, and was made in pursuance of a well-defined and matured policy of investigating hours of labor and wages in the principal departments of the iron and steel industry at regular intervals. The bureau's report of its findings is of special significance at this time, in view of the recent report from the council of churches.

The bureau's investigators reported detailed figures for various classifications of labor in the ten principal departments of the industry, and the government in summarizing its figures declared that the average full-time hours per week for all departments in 1929 was 54.6. This represents a reduction of 8.6 hours per week or 13.6 per cent from the average in 1922, just prior to the year when the industry took steps to abolish the 7-hour day. It is 11.5 hours per week less than in 1913, a decrease of 17 per cent from the 1913 figure, 66.1.

The bureau's figures, although not so designed, tend to refute some of the inferences drawn in the council of churches report. For purposes of comparison, the important features of the church report are first given, and will be followed with facts presented in the bureau of labor report.

The graduate students "covered" 175 plants, belonging to 127 companies, the districts being Alabama, Ohio, Pennsylvania, Maryland, Western New York and Northern Illinois. To quote from their report: "The viewpoint of the workers was obtained by calling at homes, by conversing with men as they came from work, through conversations held inside the plants, or from union officials, who were asked for leads to sources of information." Statistics also were obtained by direct inquiry to company officials.

What the Council Claims

Only companies operating some form of elemental processes of steel production such as blast furnaces, open-hearth furnaces, bessemer converters and rolling mills were included in the study. The plants employed 248,247 men, and as shown in the above summary of the council's report 66,712 or 26.9 per cent were working seven days per week, 130,301 or 52.5 per cent were on six days a week, and 51,234 or 20.6 per cent on 5 to 5½ days.

"While the 8-hour day is a considerable improvement over the 12-hour day for men in continuous processes, the investigators are of the opinion that the 8-hour day still involves much 7-day work," the report states. "Under the so-called forward rotation scheme it is necessary for each man to work a double shift once in three weeks." Other statements made in the report are as follows: "Wage rates for common labor range from 24 cents to 56 cents per hour, but in the majority of cases the range is from 35 to 45 cents. Group insurance is in effect in at least 88, or 57 per cent of the 155 plants. A pension system is in effect in at least 28 or 18 per cent of the plants."

The report of the President's Conference Committee on Recent Economic Changes in the United States, recently published, after surveying the major industries of the United States declares: "The largest reduction in hours seems to have been made in the iron and steel industry." This report adopted the bureau of labor figures showing average full-time hours per week as follows:

1913	66.1	1922	63.2
1914	64.9	1924	55.2
1915	65.5	1926	54.4
1920	63.1	1929	54.6

Although the average full-time

working week was two-tenths of an hour longer in 1929 than in 1926, due to the extraordinary demands for steel, the present working week, according to the bureau, is less than in any year prior to 1926. An average of 54.6 hours per week is equivalent to 9.1 hours per day for six days.

The reduction in full-time hours per week since the industry began to eliminate the 7-day week is 16 per cent at blast furnaces; 18.5 per cent at open-hearth furnaces; 21.8 per cent at bessemer converters, 12.4 per cent at plate mills; 9.1 per cent at bar mills; 8.9 per cent at rail mills; 4.3 per cent at sheet mills; 5 per cent at tin plate mills; 3.5 per cent at puddling mills, and 4.3 per cent at blooming mills. The largest reductions have been made in those departments which were working the longest hours.

Continuous Processes a Problem

Necessity for maintaining continuous processes and at the same time avoiding working men more than six days a week or equivalent has been a problem for iron and steelworks, and the government reports indicate rapid and substantial progress in that direction. The reports do not show the number of men working seven days a week, but indicate that by far the largest percentage of men work from 48 to 60 hours per week, even in continuous-process departments. These are equivalent to eight and ten hours per day, respectively, for a six-day week.

The government report shows the average of earnings per hour in the iron and steel industry is 67.4 cents. The lowest rate is in the blast furnace department, with an average of 52.8 cents, and the highest in sheet mills, with 79.3 cents.

Employment on Upgrade Federal Service Says

All reports indicate that an upward swing to employment is in motion, according to the United States employment service. Iron and steel, the barometer, shows increased employment, the service states in its current bulletin.

"A great volume of unemployment was apparent during the first half of January," it says, "and while there still is considerable unemployment the latter part of the month, showed a vast improvement, which will continue with greater momentum until it is believed that within the next 60 to 90 days the country will be on a normally strong employment basis.

"Building operations were curtailed in many states owing to weather conditions, and a large number of carpenters are unemployed. Highway construction and municipal improvements were held in check owing to weather conditions. Operating schedules in many of the industrial establishments were curtailed and employment reduced owing to inventory taking and repairs to plant equipment."

In iron and steel employment the service points out that "many who were temporarily released during the latter part of 1929 have been recalled to work. The outlook for iron and steel is very encouraging."

The general manufacturing employment index for January was 90.2, compared with 97.5, the average for 1929; 93.8 for 1928; 96.4 for 1927, and 100 for 1926. The employment service's bulletin is based on late January and early February reports.

The Driver-Harris Co., Harrison, N. J., has been awarded a gold medal for its exhibition at the Exposition Internacional de Barcelona, Spain, in 1929. The company manufactures heat-resisting alloys of nickel-chromium steel, the finished material including wire rods, sheets and castings.

Crane Speeds Loading Large Cargo of Scrap

LOADING the freighter MAX M. BROAD with approximately 2200 tons of machine shop turnings in 30 hours was accomplished recently at the yards of J. Kovinsky & Sons Ltd., East Windsor, Ont., on the Detroit river. The scrap was loaded by means of a crane equipped with a 60-foot boom and a 1½-yard bucket, a product of the Link-Belt Co., Chicago. The crane, shown loading the boat in the accompanying illustration, also is equipped with a 45-inch diameter magnet for handling 500-pound bales of compressed busheling scrap and for handling loose machine shop scrap in the yard.

Busheling scrap consists of tin plate strips or waste trimmings from automobile bodies and is compressed into small bales for convenience in handling and shipping. The cost of loading the scrap into the boat with the above mentioned equipment was estimated to be not over 4 cents per ton. The magnet used in the loading may be seen in the right foreground.

Structural Trade Practice Code

DEFINITIONS

The structural steel industry includes any person, firm or corporation hereinafter designated the "distributor" engaged in manufacturing, selling, distributing or erecting structural steel for construction purposes.

A distributor is either a Mill, a Warehouse, a Fabricator or an Erector, or any or all of them.

For the purpose of these proceedings a Mill is a manufacturer of structural materials for construction purposes who sells to a Warehouse or Fabricator.

A Warehouse is a concern that carries a well-selected stock of plain materials, buys in suitable quantities and resells to Fabricators, Erectors and others and assumes the credit risks and such other obligations as are common to such sales.

A Fabricator is a person that maintains a shop for the fabrication of plain materials for construction purposes and assumes the credit risk and such other obligations as are common to such sales.

An Erector is a concern that generally contracts with buyers to furnish and erect structural steel and fabricated by himself or others and assumes the credit risk and such other obligations as are common to such sales.

GROUP 1

Rule 1—Material. To use or to substitute materials in a structure inferior in quality to those specified by the purchaser, without his knowledge or consent, or to that required by the applicable governmental laws, rules and regulations in the territory affected, is an unfair trade practice.

Rule 2—Methods of Manufacture and Erection. To use methods of manufacture and erection not in accord with the applicable governmental laws, rules and regulations obtaining in the territory affected is an unfair trade practice.

Rule 3—Selling Below Cost. The sale of material below cost for the purpose of injuring a competitor or with the effect of lessening competition or to create a monopoly is an unfair trade practice.

Rule 4—Dumping. For steel distributors to sell their products or material below cost beyond their usual marketing territory or elsewhere for the purpose of injuring a competitor or with the effect of lessening competition is an unfair trade practice.

Rule 5—Commercial Bribery. The secret payment or allowance or acceptance of rebates, commissions, credits, discounts or like concessions, whether in the form of money or other valuable thing, or any secret understandings or agreements to do work or to furnish material on terms other than those set forth in the contract between the parties, where the tendency is to lessen competition or create a monopoly, is an unfair trade practice.

Rule 6—Defamation of Character. Dissemination of false or misleading information relative to competitors' products, selling prices, credit standing, ability to perform work, or labor conditions among competitors' employes, is an unfair trade practice.

Rule 7—Check Bids. Knowingly to submit a bid after a contract has been awarded to a distributor, with the intent of injuring a competitor, is an unfair trade practice.

Rule 8—Discrimination in Price. Any discrimination in price between purchasers, whether subsidiaries of the manufacturers or otherwise, in violation of the Clayton act, is an unfair trade practice.

GROUP 2

Rule 9—Unfair Practice. For any person, firm or corporation to aid or abet another engaged in unfair trade practices is condemned by the industry.

Rule 10—Proper Designs. To recognize uneconomic or an unsafe structural design is condemned by the industry. NOTE: For the purpose of defining that which constitutes a "proper" or "improper" structural design, "proper" design shall fully meet requirements of good engineering practice; likewise all architectural requirements, if any, and all local building code requirements, regulations or governmental laws. Design drawings shall be fully dimensioned so as to locate every piece of steel by at least one set of dimensions. For all classes of structure the various component members and details of design and any information of an unusual character shall be shown in sufficient detail as to indicate clearly the fundamentals of the design. Design drawings shall be fully checked by the designer, who shall be responsible for their compliance with the requirements set forth in this resolution.

Rule 11—Regulations of Manufacture and Erection. In territories where no governmental laws, rules or regulations as to manufacture and erection of buildings prevail, the standard specifications and code of standard practice of the American Institute of Steel Construction Inc. shall be used.

Rule 12—Lump Sum Bidding. It is patent that more intelligent costs can be estimated where the character, scope, quantity and detail of the work are clearly defined, for which reason the industry urges that bids so far as practicable be made on a lump sum basis from proper designs; but where such method of bidding is impracticable, figuring the final weight in any other way than the accepted practice of the industry as set forth in the standard specifications and code of standard practice of the American Institute of Steel Construction Inc. unless otherwise specifically set forth in the invitation to bidders, is condemned by the industry.

Rule 13.—Misrepresentation. Misleading promises of delivery and performance that cannot reasonably be fulfilled and misleading statements as to ability to perform the work is condemned by the industry.

Rule 14—Unrequested Bids. To subvert a custom prevailing in the trade to submit a bid without having been requested or invited to do so is condemned by the industry.

Rule 15—Reopened Bidding. It is a frequent practice for steel distributors to submit bids to general contractors who in turn use the lowest acceptable price from the several trades in making up their bids on a general contract. Many general contractors after securing the general contract then reopen the bidding for the same operation, commonly known as "shopping," which practice lowers the standard and quality of building construction. Such practice is condemned by the industry.

Rule 16.—Price Differentials. It is recommended to the manufacturers of structural steel that they independently observe and publish to the purchasing trade, price differentials to cover the increased cost of materials sold in less than carload quantities.

APPENDIX "A"

RESOLVED, That a committee of five appointed by this conference be empowered to draft and present to the industry for their approval standard proposal and contract forms; and such committee is directed to prepare such forms at as early a day as practicable after this code becomes effective; and further that the present committee on code of practice be and is hereby chosen as such committee.

APPENDIX "B"

RESOLVED, That a committee on trade practices be created and empowered to investigate whether these resolutions are being observed, to make complaints concerning alleged violations, to cooperate with the federal trade commission, and generally to perform such other acts as may be reasonably necessary and proper to put these resolutions into effect and accomplish the objects and purposes of this conference. The American Institute of Steel Construction Inc. is empowered by this conference to appoint said committee.

Officers Nominated for Foundry Association

Nominations for officers and directors of the American Foundrymen's association have been made by the nominating committee of the association and are as follows: For president, to serve one year, N. K. B. Patch, secretary, Lumen Bearing Co., Buffalo; for vice president, to serve one year, E. H. Ballard, general foundry and pattern shop superintendent, General Electric Co., West Lynn, Mass.; for directors, each to serve three years, C. S. Anderson, vice president and general manager, Belle City Malleable Iron Co., Racine, Wis.; H. R. Culling, vice president, Carondelet Foundry Co., St. Louis; Fred Erb, Erb-Joyce Foundry Co., Detroit; R. M. Maull, treasurer, Tabor Mfg. Co., Philadelphia; and D. M. Scott, vice president, Gould Coupler Co., Depew, N. Y., and the Symington Co., Rochester, N. Y.

Unless further nominations are made as prescribed in the by-laws of the association prior to 60 days before the annual convention, the above officers and directors will be declared elected.

Institute of Metals To Meet in March

The twenty-second annual general meeting of the British Institute of Metals will be held at the Institution of Mechanical Engineers London, March 12-13. Dr. R. Seligman, the new president will read his presidential address at the opening session. The annual dinner will be served at Hotel Victoria, March 12.

Papers to be presented are as follows: "Experiments on the Influence of Gases on the Soundness of Copper Ingots," by N. P. Allen; "Unsoundness in Bronze Castings," by E. J. Daniels; "Gases in Copper and Their Removal", by W. E. Prytherch; "Protective Value of Some Electro-Deposited Coatings," by L. Davies and L. Wright; "The Diffusion of Zinc in Copper Crystals," by C. F. Elam; "Macrostructure of Cast Alloys—Effect of Turbulence Due to Gases," by R. Genders; "The Aluminum-Brasses," by R. Genders; "Atmospheric Action in Relation to Fatigue in Lead," by B. P. Haigh and B. Jones; "Investigation of the Effects of Impurities in Copper. Part VI—The Effect of Phosphorus in Copper," by D. Hanson, S. L. Archbutt, and Grace W. Ford; "A Note on Metallic Magnesium," by W. R. D. Jones; "A Note on Zinc-Base Die-Casting Alloys," by R. Lancaster and J. G. Berry; "The Early Use of the Metals," by T. A. Rickard; "The Composition of Eutectics," by D. Stockdale.

The annual May lecture will be given May 7 by Major F. A. Freeth, joint research manager, Imperial Chemical Industries Ltd. The autumn meeting will be held in Southampton from Sept. 9-12. G. Shaw Scott, 36, Victoria street, Westminster, London, S.W.1, is secretary of the institute.

Commission Passes Code of Trade Practice

REPRODUCED on the opposite page is a trade practice code which now becomes the rules of business conduct for the structural steel industry. At a trade practice conference held in Biloxi, Miss., Nov. 11, 1929, *in conjunction with the annual meeting of the American Institute of Steel Construction Inc., a code was formulated subject to approval of the federal trade commission. That code, given in full on Page* 1310 *of the Nov.* 21, 1929, *issue of* IRON TRADE REVIEW, *has been considered by the commission and with certain modifications is approved. Two resolutions in the first draft were designated appendixes and made a part of the code. No action was taken on the six definitions presented as a preface to the rules.*

—THE EDITORS

New Manganese Plant Is Opened in Virginia

The new manganese ore concentrating plant of the Hy-Grade Manganese Production & Sales Corp., Woodstock, Va., has just been completed and placed in operation. This is the third large domestic manganese plant to go into production in recent months. The other two being the plants of the Domestic Manganese & Development Co., Butte, Mont., and the Georgia Manganese & Iron Co., White, Ga. The potential capacity of the three plants combined exceeds 200,000 tons of ferro-grade manganese ore a year.

Development of the Hy-Grade mine has been carried on for the past eight years and construction of the milling plant has been underway for the past year. The plant has a capacity of 30,000 tons of ferro-grade manganese ore each year.

Detect Currents in Oil Pipe Lines

An attempt by the bureau of standards, Washington, to correlate pipe line corrosion with soil conditions resulted in the discovery of electric currents on oil lines remote from electric railways. On some lines a relation appeared between the discharge of current and corrosion. The possibility is suggested that when a line passes fom a dry to a wet soil or through two soils a galvanic cell is formed. In three instances current flowed toward a junction of an old and a new line on the old line, and away from the junction on the new line, indicating that the new line was corroding because of its connection to the old one. On a few lines the currents were varied in magnitude and reversing in direction from time to time. Pump station operations seem to affect the current on some oil lines, according to the bureau.

Booklets Discuss Floors Made of Concrete

Construction of industrial buildings and private homes, forms the background for two new booklets on reinforced concrete. One entitled "Reinforced Concrete Floors for Residences," is a reprint from *Concrete* published by the Concrete Reinforcing Steel institute, Chicago, and the other, "Sizes of Removable and Permanent Forms, Pans, or Domes Made of Wood, Steel, or Other Material Used in Concrete Ribbed Floor Construction," is a simplified practice recommendation issued by the bureau of standards.

The first booklet is a series of articles describing and recommending the construction of reinforced concrete flooring in all types of private dwellings. A maximum of steel reinforcing is recommended, and the floors are designed to give harmony and continuity to the building and room design.

The bureau of standards publication is the result of a number of conferences designed to cut down the complexity of steel forms now in use. The recommended practice has been accepted by a majority of firms competing in this field and leads to a saving in construction costs for all makers of steel forms for concrete floors and ceilings. Copies of the booklets may be obtained from the Concrete Reinforcing Steel institute, Tribune Tower, Chicago.

Construction Benefits as Steel Mills Jockey for Position

Heightened Competition of United States Steel and Republic Forces Other Producers to Round-out Facilities—Aids Hoover Program

By E. C. Barringer

Associate Editor, Iron Trade Review

OUT of an intensified competitive situation in the iron and steel industry is developing a construction program which dovetails with the campaign, initiated at Washington by the President and the national business survey conference, to proceed immediately with construction work contemplated for 1930, in order to give impetus to general business at this time.

Since Jan. 1 an unusually large volume of construction has been authorized or discussed by the industry, and if last fall's decision of the United States Steel Corp. to enlarge its Chicago district steelmaking subsidiary—the Illinois Steel Co.—be included, then a record total of expansion has been proposed in the past six months.

Meanwhile, the industry has been proceeding with the maintenance, repair and cleanup work usually reserved for lean periods of production, as James A. Farrell, president of the Steel corporation, brought out at the President's business conference last Dec. 5. This work is the greater on account of the strain upon the industry last year in piling up pig iron and steel ingot production records.

New Leaders Hold Interest

For a number of months the Steel corporation and the group now assembled into the new Republic Steel Corp. have been in the spotlight. The aggressive policy brought to the Steel corporation by Myron C. Taylor, chairman of the finance committee, has released the energies of Mr. Farrell and his executives. The Republic merger is calculated to set up the second largest independent producer and tie important consumers in with related producers.

With two such important factors, representing close to half of the country's iron and steelmaking capacity, displaying such aggressiveness, other producers have been doing the logical and prudent thing of looking to their market positions. Accordingly, the Youngstown Sheet & Tube Co., Jones & Laughlin Steel Corp. and National Steel Corp.—to cite only three—have moved into the headlines recently. And in each case the matter of new construction weighs heavily.

Youngstown in Merger Discussions

Youngstown, which several years ago almost merged with the Inland Steel Co. and for a long time was expected to be a component of the Republic group, is again holding merger discussions with Inland and is adding a continuous sheet mill at its Brier Hill works. Continental Shares Inc., the Eaton investment trust which effected the Republic merger, is the largest shareholder of Youngstown and also has large holdings in Inland.

Obviously, therefore, whether Youngstown aligns itself with Inland to form another large independent merger, or goes into Republic, or stands alone, will be determined largely by the potential effect upon the industry as a whole and the portfolio of Continental Shares. Meanwhile, Youngstown is putting up to $10,000,000 into its new mill.

Jones & Laughlin, largest personally-owned steel producer and traditionally enlarging by accretion rather than purchase or merger, is reported on the verge of an important program. There are unconfirmed reports that the corporation will spend $20,000,000 to $40,000,000 in extensions and betterments in the next two years. One report is that this producer will add strip-making capacity.

An expenditure of this caliber may indicate more than enlargement of its South Side and Aliquippa works at Pittsburgh. For a number of years Jones & Laughlin has owned an attractive plant site in the Chicago district, along the ship canal which taps Lake Michigan between the Youngstown and Inland plants at Indiana Harbor, Ind. It seems probable that under the guidance of George Gordon Crawford, new president, noteworthy developments are near, at least at Pittsburgh.

National Steel Corp., formed in 1929 by the combination of the Weirton Steel Co., Great Lakes Steel Corp. and some subsidiaries of the M. A. Hanna Co., is maturing plans for a completely-rounded out organization. It has ordered a bar mill for the Great Lakes strip plant now being completed at Detroit. It is soon to rebuild a Hanna furnace at Zug island, Detroit.

A Weirton furnace will be enlarged to a daily capacity of 1000 tons. The Donner, Hanna Coke Corp., Buffalo, in which National Steel has a half interest, is adding 50 by-product ovens. National Steel has purchased 1100 acres on Lake Michigan, east of Gary, Ind., as the site of a western iron and steel works.

Newton Starts New Mill

The Newton Steel Co. started its new sheet mill at Monroe, Mich., Monday. Eventually open-hearth furnaces and a bar mill will be installed. Michigan Steel Corp., regarded as eventually passing to National Steel, is about to increase its capacity 30 per cent by a rearrangement of present facilities. The American Rolling Mill Co. has been considering erecting a plant at Detroit, and rumors of still another steelworks in that district are current.

The DuPont Ammonia Corp., Belle,

W. Va., recently contracted for 48 by-product coke ovens for immediate construction. The Bopp Steel Corp. has broken ground for a cold-rolled strip mill at Detroit. Ford Motor Co. is inquiring for electric furnaces and a cold-rolled strip mill. Canadian Steel Corp., subsidiary of the United States Steel Corp. is building a tin plate mill at Ojibway, Ont.

Other Increases Planned

The Gulf States Steel Co., in which Continental Shares has an interest, is now increasing the capacity of its open-hearth furnaces, on May 1 will bring in its new plate mill, and is now taking bids on sheet mills. Altogether it contemplates an expenditure of $17,000,000 to $20,000,000 on improvements. The Allegheny Steel Co., Pittsburgh, is spending $500,000 on general plant betterments. The Tarentum Steel Corp. is taking bids on a sheet mill at Tarentum, Pa.

The Bethlehem Steel Co. at present has betterments under way at its Johnstown, Pa., and Sparrows Point, Md., plants. Having recently completed reconstruction of its Lackawanna plant at Buffalo, no further improvements are looked for there. As of Dec. 31 Bethlehem had improvements under way or authorizing costing $52,600,000.

In 1930 Republic is expected to be bending its efforts on digesting the merged properties. A certain amount of relocating of capacity will be involved. For instance, production of alloy steels is expected to be concentrated at Massillon, Canton and Chicago. For this and similar work large sums may be needed.

Not including the reported Jones & Laughlin plant expenditure or the Steel corporation or Bethlehem projects under way before Jan. 1, it is estimated $50,000,000 worth of construction has been started or ordered this year. The Steel corporation's 21 open-hearth furnaces and new mills at Gary and South Chicago, plus new units for the National Tube Co. and proposed open-hearths and bar mills at the Cleveland plant of the American Steel & Wire Co., call for an outlay approximating $200,000,000. Current repair work in the industry probably involves $10,000,000.

Acoustic Engineer Shows Pictures of Sound

Transformation of sound into electrical energy, and the subsequent use of this energy to distort a ray of light into a series of dancing formations shown on a screen formed the theme of a lecture "Some Secrets of Musical Sounds" delivered by William Braid White, director of acoustic research, American Steel & Wire Co., Chicago, in Cleveland Feb. 12.

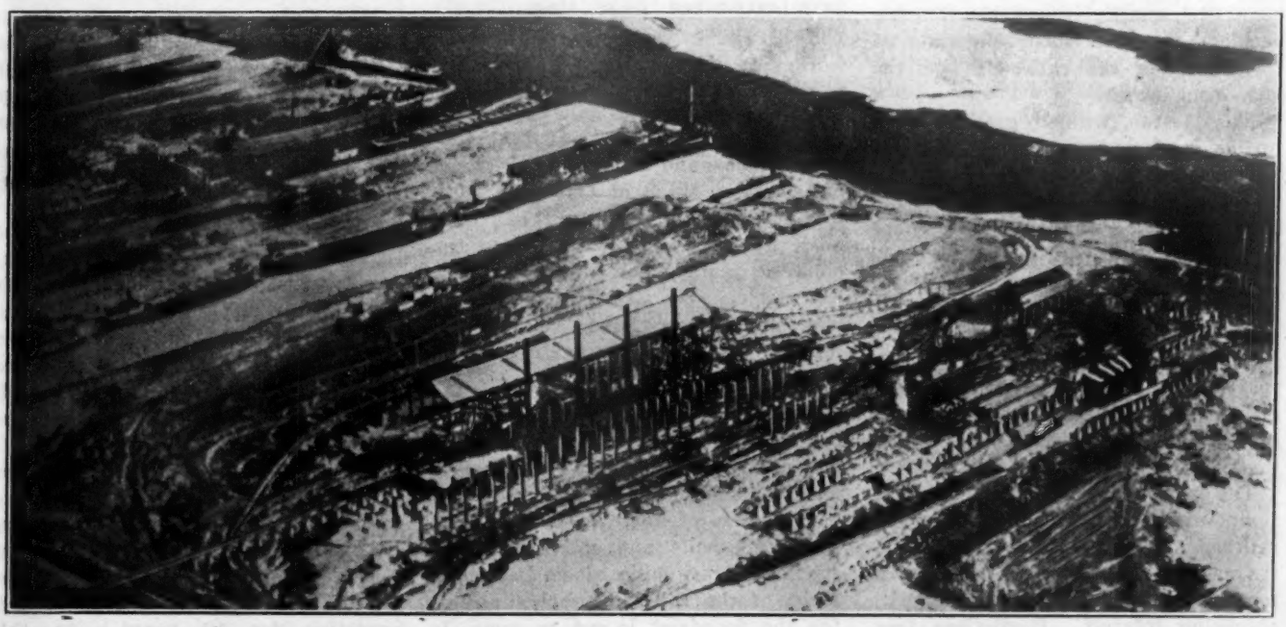
The lecture, delivered under the auspices of the Steel corporation subsidiary in conjunction with the Cleveland plant of the Westinghouse Electric & Mfg. Co., brought out the use of the osiso in the transformation of sound into light. Developed by the Westinghouse company, the osiso showed the varied use that instantaneous photographs of the light ray would have when translated into their relative musical relationships; and indicate the use of this form of information in conjunction with the testing of all forms of wire to develop the best potentialities in the material and fit them for maximum service in many fields totally unrelated to music.

Management Group Plans Marketing Meeting

Inauguration of the activities of the newly formed industrial marketing division of the American Management association, will take place with the opening of the first Industrial Marketing conference at the Blackstone hotel, Chicago, March 5-6. The new division is headed by C. R. Cary, vice president in charge of sales, Leeds & Northrup Co., Philadelphia, and the initial conference will be held in conjunction with the National Management congress which is to be held at the Stevens hotel, Chicago, March 3-5.

Topics for discussion include "What's Around the Corner in Industrial Marketing?" "Determining Channels of Distribution for Producer Goods," "Trends in Industrial Sales Promotion and Advertising," "Sales Personnel Problems," and "Forecasting and Market Research."

Among the speakers will be E. O. Shreve, General Electric Co.; John G. Thompson, Simonds Saw & Steel Co.; Forrest U. Webster, Cutler-Hammer Inc.; Dr. R. J. McFall, bureau of the census; Malcolm Muir, president, McGraw-Hill Publishing Co. Inc.; Walter Emery, United States Rubber Co.; W. A. McDermid, consultant in sales management; J. L. Palmer, University of Chicago; Charles A. Fine, Alemite Corp.; Lincoln Lothrop, Bigelow, Kent, Willard & Co.; and T. M. McNiece, Union Carbide & Carbon Co.



Airplane progress view of new plant of the Great Lakes Steel Corp., a unit of the National Steel Corp., being erected just south of Detroit. Six open-hearth furnaces, semifinished capacity and strip and bar mills are under way

Steel Angles from Chicago

Carriers Expect To Better Lead as Steel Buyers

Tractor Styles Revised, Calling for New Steels

CHICAGO, Feb. 18

ADMITTING that steel requirements of the metalworking industries have shown vigor since the first of the year, and that steel tonnage in this district is pointing upward steadily, the casual observer of steel trends usually is heard to qualify that the tangible backlogs thus far have come almost entirely from the railroads and the implement works.

This is true, without granting that turgid buying in any one type of consumption has resulted. Despite a moderate volume of automotive and miscellaneous tonnage, adding hope and a bulge to order books, the railroads and car, implement and tractor manufacturers without question have been the vitalizing force in the steel industry here thus far in the year, and have helped gear Chicago district steelworks operations a pace ahead of other districts in recent weeks.

The news of the 1929 steel consumption analysis, showing how the railroads by nearly 1 per cent outstripped the automotive industry in tonnage consumed, was received with absorbing interest. Predictions freely made in this district are that 1930 will register a 3 to 4 per cent gain for the railroads.

* * *

ON THE order books of rail mills in this district are scheduled nearly 1,225,000 tons of rails for 1930 primary needs. Railroad car awards have earmarked more than 150,000 tons of plates, bars and light shapes since the first of the year for this district. Implements and tractors, in actual specifications, have accounted for slightly less than half that tonnage of bar and strip steel, castings and plates. Much of this year's implement and tractor output has been made up for foreign account, but the domestic market now is getting into its stride. Six tractor makers in western territory have been producing for several weeks against orders from Russia.

Railroad accessories have been giving steel foundries and car wheel casting shops work for several months, and have placed 90,000 to 100,000 tons of angle bars, tie plates, and track bolts and spikes with the steel finishing mills since December. Much of the railroad supply business for the foundries is yet to come. In the spring these producers will begin to get the benefits from recent railroad orders.

* * *

CAR building plants in the Gary-Hammond-Indiana Harbor area are reaching full operations for the first time in many months. The Michigan City, Ind., plant of Pullman Car & Mfg. Corp., with a capacity of 700 to 1000 cars monthly, has been in a more fortunate position than most of the car building shops in this territory, having operated for at least 11 months of the year for some years. This works now is at nearly full capacity.

Standard Steel Car Co.'s works at Hammond, Ind., with fresh car orders, is reaching the point where it soon can swing into full production. Ryan Car Co., also at Hammond, with a capacity of about 250 cars a month, will start next month on nearly full production when the assembly of the Rock Island cars commences.

Unfortunate in the scheme of things for the car builders is the fact that operations are not continuous, or have not been so in recent years. American Car & Foundry Co. has not had all its plants in full operation for 10 years. At this time, its works in the St. Louis dis-

trict, where the company builds against most of its car contracts for the western carriers, is enjoying a higher rate of operations than the average for that producer. Its plant in Chicago builds refrigerator cars largely, and recently has been operating only part time. That company's plants, as a whole, have been averaging about 40 per cent for several years.

* * *

WESTERN car shops now need a spurt of spring activity to help fill gaps between delivery requirements on pending car orders. Labor conditions for the car builders are much improved over last summer, when sporadic strikes of minor proportions developed in the Gary-Hammond car building district. American Car & Foundry Co.'s Chicago plant, at Twenty-fourth and Paulina streets, is fortunately situated in one of the best labor marts of the metropolitan area. It is disconcerting, on the other hand, to be forced to lay off trained staffs of workmen after six months' operations.

With interrupted operations, due to light car buying in recent years, has come necessary training of new organizations as work was resumed, adding complexities to operating problems and much to overhead.

Recent labor troubles have resulted from extra wage demands, but these did not come from union organizations. Aside from union machinists, the car shops' labor problems are simplified by having few union employes. Indications are that this year will see improved labor conditions.

* * *

AN ORDER for car steel for 1000 units looms to the steel rolling mill like an important skyscraper project. Only an unusual commercial building would take an equivalent volume of steel.

That the average railroad car takes much more steel than formerly is demonstrated by the analysis of the country's steel consumption by groups. This shows that in the years when 100,000 cars were built the railroads have taken about 25 per cent of the entire output of finished rolled steel. Steel hopper cars, above the wheels, now consume 12 to 14 tons each of steel; gondolas, about 10 to 12 tons; automobile-box, about 10 tons; while ordinary box cars require 6 to 8 tons, the amounts being exclusive of center plates, wedges and side beams. About 2½ tons of cast or rolled steel wheels are used for each car, besides about 2 tons of axles. This makes an average of about 18 to 20 tons per car.

* * *

IN GENERAL, the carriers this year are asking for fairly prompt shipment on the cars they have ordered. Assembly of material now is in progress for the more than 3000 cars of the Chicago, Milwaukee, St. Paul & Pacific railroad ordered several weeks ago. Actual building operations will be started before May 1. Assembly of steel and other materials, ordinarily requiring 60 to 90 days, in some cases is being shortened. The length of time depends upon several factors, including delivery positions of the rolling mills, class of material needs and decisions as to unusual types of car designs.

Delivery of the Rock Island cars, ordered several months ago, has been held back, initial shipment of finished cars having been specified for April 1. Actual building operations will be started by the western shops on this order early next month. Shipments of steel have been in progress for more than 30 days.

Railroads now are beginning to press for shipments of rails and track accessories. Illinois Steel Co. and Inland Steel Co. rail mills have been speeded up to practical capacity, and those mills are in a position to operate at that rate until midsummer.

* * *

A MILD sensation has been created by the statements of 1929 earnings of the farm implement companies. Deere & Co. set a new all-time record with a net of $15,181,949 available for dividends in the year ended Oct. 31, last. This exceeded by 63 per cent the previous 1928 record. The 1929 net income, which is after all charges, including liberal provisions for reserves, equaled $68.60 a share on the common stock, as against $37.50 in 1928.

Other implement and tractor companies showing favorable earnings statements are International Harvester Co. and Oliver Farm Equipment Co. International Harvester Co. cites its growing organization for distributing and servicing its implements and trucks, which places it in an advantageous position regarding world sales.

Domestic sales of the company's trucks increased from 14,000 units in 1928 to 31,000 last year and this business is expected to show further growth this year. That company points out that it has been able to reduce costs of servicing farm implements and trucks to the satisfaction of buyers, always costly to organizations large or small.

* * *

NEW styles in farm tractors are likely to contribute to the marketing of more finished steel products, forgings and castings, but some of the new useful attachments are almost as revolutionary in character. There may be no marked expansion in the use of metal products during 1930, but a definite trend in that direction is discernible, and shifts in the types of steel to be used are certain to occur.

Implement distributors throughout the West and other sections, snatching the cue from the automobile shows, are going to have one day or a week this spring of "open house" to demonstrate the latest in equipment.

More new tractor models have appeared than in any season since the war period, it is observed by Tudor Charles Jr., of the research department of the National Association of Farm Equipment Manufacturers. Outstanding in tractor developments is the adoption of alloy and special steels, with the growing tendency toward lighter weight, and at the same time more power in the field and on the belt. Along with these traits are demanded "hardiness" and low fuel consumption.

Among new ideas in the 1930 tractors family are rubber tired steel wheels which may be used for road hauling, a power lift for raising plows or cultivators while the outfit is stationary, additional forward speeds for faster operation on the highways, and further standardization and application of the power take-off. Sprayers, binders, corn pickers, plows and mowers are tools to which this principle has been applied. The trend is described as being distinctly toward dependable, long-life tractors, with plenty of power and as little excess weight as possible.

* * *

THE transportation building of the Century of Progress exposition, or Chicago world's fair of 1933, will have two great domes, which will begin with a 300-foot circle, cut in at the second story, it is announced. The two domes are to be connected by a low building of about 700 feet. These domes are to be absolutely free. From towers built on the side there will be steel cables, not unlike a suspension bridge, with a spider-web structure coming down from them, holding or elevating them from above, instead of having steel members from beneath.

These cables are to be chromium plated, with brilliant surfaces, and

instead of having round wires, all wires will have flat surfaces, giving large facets to reflect light. Colored lights will be turned on these cables, and they will come down in streamers on the side.

"We are going to pioneer in construction and the use of materials," the manager of the fair, Maj. L. R. Lohr, states. "The architecture will be non-formal; there will be no perfect balancing. We have some specifications. First, these buildings must be cheaply constructed because we have got to make a return on our capital investment in 150 days of operation. They must be absolutely safe, as we cannot risk injury to life or limb, and they must be safe against fire.

"There are priceless art treasures we cannot risk being damaged. The buildings must be easily salvaged. Imagine 5,000,000 feet of concrete monolithic floor! It will cost over a million to tear that concrete up, and of course it is worthless when it is torn up. Therefore, we must be able to salvage economically, and again we must try to get a high salvage value for the materials, or we cannot afford to put up the buildings that we would like to erect."

Mining Institute Names Officers for 1930

William H. Bassett, metallurgist, American Brass Co., Waterbury, Conn., was elected president of the American Institute of Mining and Metallurgical Engineers which is holding its annual meeting in New York this week. Henry Krumb, consulting mining engineer, Salt Lake City, Utah; and Scott Turner, consulting engineer, United States bureau of mines, Washington, were named vice presidents. Directors were elected as follows: R. C. Allen, executive vice president, Oglebay Norton & Co., Cleveland; Cadwallader Evans Jr., consulting engineer, Hudson Coal Co., Scranton, Pa.; John M. Lovejoy, president, Petroleum Bond & Share Corp., New York; John A. Mathews, vice president, Crucible Steel Co. of America, New York; and Milnor Roberts, dean, college of mines, University of Washington, Seattle.

The iron and steel division chose as its chairman W. J. MacKenzie, vice president, Interstate Iron & Steel Co., Chicago. Vice presidents are C. S. Robinson, second vice president, Youngstown Sheet & Tube Co., Youngstown, O.; J. T. MacKenzie, metallurgist, American Cast Iron Pipe Co., Birmingham, Ala.; and C. E. Meissner, engineer, Chrome Steel Works, Carteret, N. J. The executive committee will consist of A. L. Feild, engineer, Simonds Saw & Steel Co., Lockport, N. Y.; R. F. Harrington, metallurgist, Hunt-Spiller Mfg. Corp., Boston; and E. F. Kenney, metallurgical engineer, Bethlehem Steel Co., Bethlehem, Pa.

Arrange Cost Conference

In answer to requests for a general cost conference of executives and cost accountants of member companies of the National Machine Tool Builders' association, such a conference has been arranged to be held at Hotel Cleveland, Cleveland, April 22 and 23, with morning, afternoon and evening sessions on both days. It is the final aim of the association to devise a uniform cost accounting procedure for members and at the Cleveland meeting the final results of 19 previously held regional cost meetings will be presented. Sessions have been planned for general executives as well as more detailed discussions for cost accountants. An interesting feature of the conference is to be an exhibit of accounting machinery found usable in members' plants.

Convention Calendar

Feb. 17-22—American Ceramic society. Thirty-second annual convention at Royal York hotel, Toronto, Ont. Ross C. Purdy, 2525 North High street, Columbus, O., is secretary.

March 3-7—National Industrial exposition. At Hotel Stevens, Chicago. George Pfisterer, 308 West Randolph street, Chicago, is secretary. Held in conjunction with National Management congress, and sponsored by American Society of Mechanical Engineers.

March 4-6—Institute of Scrap Iron and Steel Inc. Second annual convention at Stevens hotel, Chicago. Benjamin Schwartz, Salmon Tower building, New York, is director general.

March 5-6—American Management association. Industrial marketing division, first annual conference at the Blackstone hotel, Chicago. W. J. Donald, 20 Vesey street, New York, is managing director.

March 5-7—American Society of Mechanical Engineers. National meeting of materials handling division at Hotel Stevens, Chicago. Calvin W. Rice, 29 West Thirty-ninth street, New York, is secretary.

March 12-13—Institute of Metals. Annual spring meeting at Institution of Mechanical Engineers, London. G. Shaw Scott, 36 Victoria Street, Westminster, London, S. W. 1, is secretary.

March 31-April 2—Concrete Reinforcing Steel institute. Sixth annual convention at Bon-Air Vanderbilt hotel, Augusta, Ga. M. A. Beeman, 2112 Tribune Tower, Chicago, is secretary.

April 5-9—American Society of Mechanical Engineers. Fiftieth anniversary celebration, April 5-6 in New York and Hoboken, April 7-9 Hotel Mayflower, Washington. Calvin W. Rice, 29 West Thirty-ninth street, New York, is secretary.

April 7-12—American Oil Burner association. Seventh annual convention, and national oil burner show, Hotel Stevens, Chicago. Harry F. Tapp, 342 Madison avenue, New York, is secretary.

April 22-23—National Machine Tool Builders' association. General cost conference at Hotel Cleveland, Cleveland. E. F. DuBrul, 1415 Enquirer building, Cincinnati, is general manager.

Program Is Arranged for Reinforcing Meeting

The Concrete Reinforcing Steel institute has just announced the program for its sixth annual meeting to be conducted at the Bon Air-Vanderbilt, Augusta, Ga., March 31-April 2. Co-operation in the building industry, warehouse operation and concrete joist construction are among the subjects to be discussed by prominent speakers. Special accommodations have been arranged between Chicago and Augusta, via Washington and direct return via Atlanta. The detailed program of the meeting is as follows:

Monday, March 31

MORNING

Board of directors meeting.

AFTERNOON

Regional conferences.

EVENING

President's address.
"Co-operation in the Building Industry," by Col. George B. Walbridge, vice president, Walbridge-Aldinger Co., Detroit.

Tuesday, April 1

MORNING

"Warehouse Operation," by Walter M. Bachtell, manager of warehouse, Truscon Steel Co., Youngstown, O.
"How New Billet Bars Are Made," a motion picture by Youngstown Sheet & Tube Co.
Election of officers.

AFTERNOON

Regional conferences.

EVENING

Banquet. Address: "Not for Publication," by Edward McKernon, New York, formerly superintendent of the Associated Press.

Wednesday, April 2

MORNING

"Hot Water Cement Ratio Courses Widen the Market for Reinforcing Steel," by R. W. Johnson, engineer, Concrete Reinforcing Steel institute.
Discussion of enforcement of trade practice conference rules.

AFTERNOON

Golf tournament.

EVENING

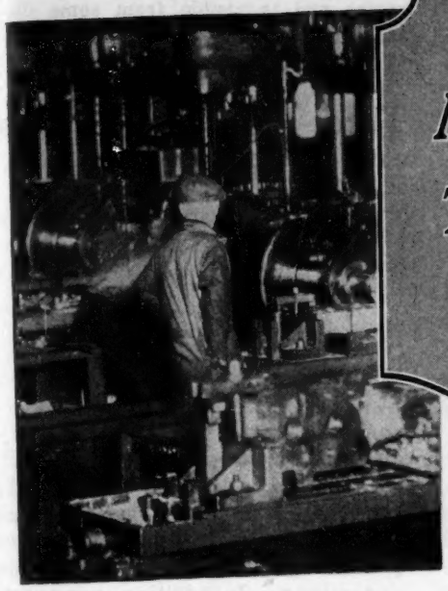
"Concrete Joist Construction," a report of the forms department of the institute.

British Institute Goes to Czecho-Slovakia

The autumn meeting of the British Iron and Steel institute will be held at Prague, Czechoslovakia, Sept. 15-20, at the invitation of the Society of Czechoslovakian Engineers (Spolek Ceskoslovenskych Inzenyru). The sessions for the reading and discussion of papers will take place Sept. 15-16 in the new building of the society. The next three days will be spent in visiting plants and other places of interest in Prague, Pilsen and Witkowitz.

Americans wishing to attend this meeting should communicate with G. C. Lloyd, secretary of the institute, 28, Victoria Street, Westminster, London, S.W.1.

Kentucky Iron Works Co., Louisville, Ky., has increased its capital stock from $3000 to $10,000.



New Machine Tools and Shop Equipment

"Magnified and shaped in steel, here is the final energy, the seed that fertilizes space."
—MacKnight Black

Inclinable Presses Made Up of Welded Plate

No. 42

La Salle Machine Works, 3013 South La Salle street, Chicago, has placed on the market inclinable presses, the bodies of which are fabricated entirely of steel plates cut to size and shape and electrically welded into units. The plates are machined both before and after welding to insure absolute and lasting alignment. An important feature of the presses is that the specifications may be arranged to suit the user's exact requirements with little extra cost. Work requiring unusual dimensions such as large die space, bed area or depth of throat can be handled in these presses economically.

New Master Switches on Steel Mill Panels

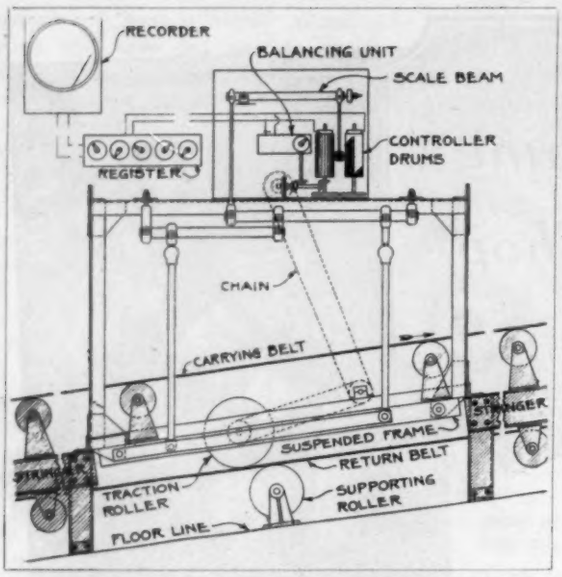
No. 43

General Electric Co., Schenectady, N. Y., announces the redesign of its line of magnetic controllers for steel mill auxiliaries. In addition to the features already provided in the superseded design, a number of improvements have been incorporated in the new units. A separate line contactor is used instead of a "circuit breaker" contactor. This is said to allow complete isolation of the motor and starting resistor from the source of power. An additional relay is used for undervoltage protection. All devices are mounted on a single compound base in the case of the smaller panels rated up to 55 horsepower, while three compound bases are used for the larger panels.

A new type of overload relay, using but one size of coil for the entire range of horsepower of any given panel, also is used. This relay is

Iron Trade Review's Calendar of New Equipment

Item	Comment	Builder	No.	Date Described	Page
Lockwashers	Two opposing ratchet disks, locked to bolt and nut	Clegg Lock Washer Corp	19	Jan. 23	40
Cement	Plastic high-temperature cement with chromite base	Botfield Refractories Co.	20	Jan. 23	40
Grinder	Hydraulic roll grinder for small diameter rolls	Landis Tool Co.	21	Jan. 23	73
Tractor	Industrial tractor, gasoline powered, 1500-pound pull	Whitehead & Kales Co.	22	Jan. 23	73
Tongs	Pipe and fittings tongs; flat link or cable chain	J. H. Williams & Co.	23	Jan. 23	74
Motors	Induction type; high speed and heavy duty	Westinghouse Electric & Mfg. Co.	24	Jan. 23	74
Bearing	Self-lubricating bronze type	Johnson Bronze Co.	25	Jan. 30	66
Micrometer	Pocket-size dial micrometer; usable as snap gage	B. C. Ames Co.	26	Jan. 30	66
Grinder	28 x 40 x 48-inch plain self-contained type	Cincinnati Grinders Inc.	27	Jan. 30	99
Welder	Automatic welding machine for wire wheel assembly	Lincoln Electric Co.	28	Jan. 30	99
Milling machine	Complete redesign of plain-type machine	Brown & Sharpe Mfg. Co.	29	Jan. 30	100
Sharpener	Full-automatic crosscut and rip saw sharpener	Samuel C. Rogers & Co.	30	Jan. 30	100
Locomotives	Gasoline powered; 20, 25 and 30-ton capacity	Fate-Root-Heath Co.	31	Feb. 6	91
Hone	Vertical cylinder hone; hydraulically reciprocated spindle	Barnes Drill Co.	32	Feb. 6	91
Speed reducers	Right angle drive type; range of 15 to 1 to 518 to 1	Falk Corp.	33	Feb. 6	91
Brake control	For crane hoists, etc.; dynamic, magnetic contactor	Electric Controller & Mfg. Co.	34	Feb. 6	91
Instruments	Voltmeters, milliammeters for low power circuits	General Electric Co.	35	Feb. 6	92
Hardness tester	Motor-driven brinell-type for precision work	Pittsburgh Inst. & Machine Co.	36	Feb. 6	92
Press	Utility press for toolroom; 80,000-pound pressure	Simplex Tool Co.	37	Feb. 6	92
Grinders	Single-speed and multiple-speed types; special design	Ransom Mfg. Co.	38	Feb. 6	92
Nut	Recessed for gasket; makes leakproof joint	Columbian Steel Tank Co.	39	Feb. 6	93
Furnace	Gas-fired laboratory furnace; heats quickly	Babcock & Wilcox Co.	40	Feb. 6	93
Saw	Wood saws; two sizes, for 12x12 and 12x20-inch timber	De Walt Products Corp.	41	Feb. 6	93
Presses	Inclinable; bodies made up of welded steel plate	La Salle Machine Works	42	Feb. 20	59
Controllers	Magnetic controllers for steel mill auxiliaries; redesigned	General Electric Co.	43	Feb. 20	59
Scale	Automatic; for weighing material on conveyor belt	John Chatillon & Sons	44	Feb. 20	60
Milling machine	Also boring and drilling; flexible control	Consolidated Machine Tool Corp.	45	Feb. 20	60
Forming machines	Two types, varying in size, for roll forming strip metal	McKinney Tool & Mfg. Co.	46	Feb. 20	61
Motor-generator	Assembled and welded to welded steel plate base	Reliance Electric & Engineering Co.	47	Feb. 20	61
Chain link	Of manganese steel; for conveyor chain	American Manganese Steel Co.	48	Feb. 20	62
Drive	For bucket elevator; speed reducer and roller chain	H. W. Caldwell & Son Co.	49	Feb. 20	62
Die stocks	Plain and ratchet types; for pipe threading work	Borden Co.	50	Feb. 20	62



No. 44—Diagram of automatic conveyor scale recording weight of material which passes over the scale on the carrying belt

claimed to be unaffected by vibration and practically all of its component parts are interchangeable with those of the accelerating relays. New master switches have been developed for use with the panels to allow single or three-point operation of the line contactor. Each switch includes double-break, silver-faced contacts carried on molded operating arms actuated by molded cams bolted to the shaft. The redesigned line of controllers also is equipped with a new type of edgewise wound resistor, arranged especially for mill service.

Automatic Scale Weighs Material on Belt

No. 44

John Chatillon & Sons, New York, and E. J. White, sales agent, 85 Cliff street, New York, announce the development of a new automatic scale for the continuous weighing of bulk materials such as coal, coke, limestone, ores, grain, etc., in transit on conveyors. The machine consists of a suspended-type scale within a rigid frame, through which the belt passes on two carrying or troughing idlers. The belt is the platform of the scale. Integration of the weight is performed electrically, employing a make-and-break arrangement and contact drums which revolve toward each other at a speed proportional to the belt travel, by means of a traction roller and transmission, as shown in the accompanying diagram of the scale.

A contactor is suspended from the end of the scale beam and moves in unison with it up and down between the drums and is caused to be vibrated rapidly against the contact drum. The surface of the contact drum, the drum to the right, is divided so that one half is a conductor of current and the other half a nonconductor. With the machine in balance and no load, no effective contacts will be closed; at full load, each cam on the make-and-break drum produces an electric impulse which operates an electromechanical device similar to that of a stock ticker or fire alarm, and this instrument is geared to a continuous register, converting the impulses into pounds, tons, kilograms, barrels, etc., at a mathematically correct ratio.

Continuous Record Possible

The scale beam is free and performs no other function than weighing. A 24-hour time chart recorder furnishes a record of each day's operation. It is controlled by the register and with the register may be installed at any distance from the scale by extending the wires to them. A load indicator is provided to inform the operator of the percentage of the load on the belt; a spot of light with a black line in its center moves up and down on a ground glass scale as the load varies and is visible from some distance from the machine. Balancing is simple and quickly accomplished.

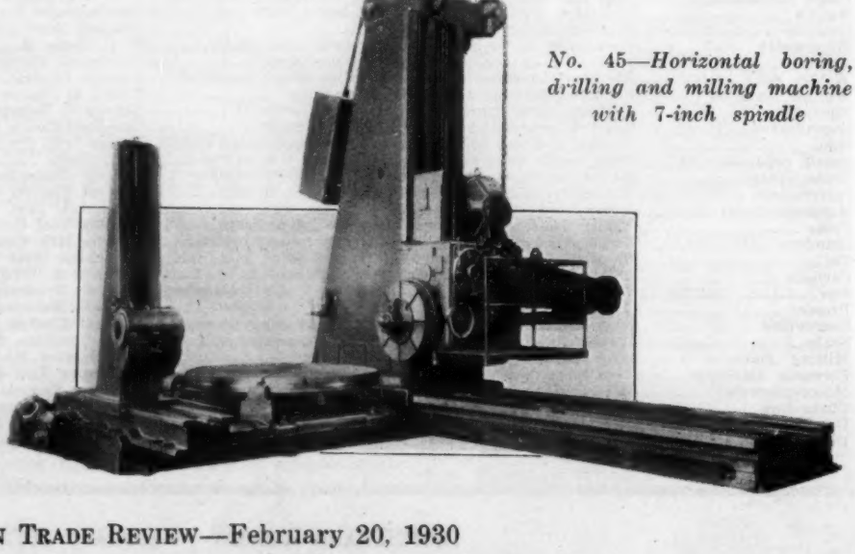
Three-Purpose Tool Has Flexible Control

No. 45

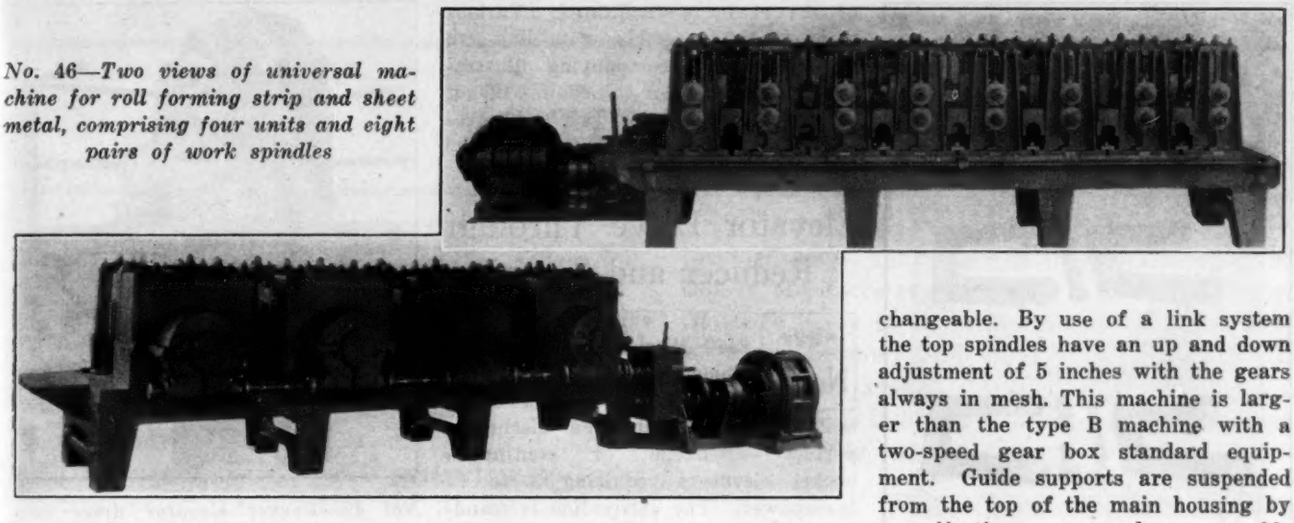
Consolidated Machine Tool Corp. of America, Rochester, N. Y., has announced the Betts horizontal boring, drilling and milling machine, floor-type and built with spindles of 5½-inch diameter up. A feature of the 7-inch machine, shown in the accompanying illustration, is that a variable-speed motor mounted on the saddle is used solely for driving the spindle. A separate variable-speed motor provides milling feed and power rapid traverse for the saddle and column. In addition, a separate motor is provided to move circular table toward and from the column runway. This arrangement of separate motors for the column and the saddle and for the spindle provides a wide range of speeds and feeds without complicated gearing.

Separate Motor Drives Table

The machine is furnished regularly with a large floor plate of heavy box construction and in addition a circular table also may be supplied, as shown in the illustration. A separate motor drives the table through worm and worm wheel. The movement of the table toward and away from the column also is provided for by a separate constant-speed motor. The steady rest is mounted on a separate carriage and can be bolted to the floor plate or can be used on the circular table runway. It has a travel by rapid hand adjustment on the runway. The boring bar bearing has a vertical hand adjustment on



No. 45—Horizontal boring, drilling and milling machine with 7-inch spindle



No. 46—Two views of universal machine for roll forming strip and sheet metal, comprising four units and eight pairs of work spindles

the column. A separate small motor mounted at the end of the saddle takes care of power rapid traverse for the spindle. The saddle has a vertical travel of 10 feet and is provided with a platform for the operator, making for easier operation of the various controls.

Centralized one-shot lubrication is provided. For boring and drilling the machine has eight feeds and is capable of cutting threads of four different leads. For milling a wide range of feeds is obtained through the variable speed motor and supplementary mechanical changes.

Two Machines for Roll Forming Work Built

No. 46

McKinney Tool & Mfg. Co., 1688 Arabella road, Cleveland, is manufacturing two new types of machines for roll forming strip and sheet metal, a type B and type C machine. The type B machine is of dual capacity and may be used as a standard two housing machine for heavy work or, by pushing the front housings back until the ends of the work spindles are exposed, a strong and convenient outboard machine for light work is obtained. The base is a heavy box-type casting. Housings are semisteel castings, the main housings being grooved to the bed and doweled in place. The front housings slide from front to rear on a guide strip doweled to the bed and are held in at any desired position by clamp bolts in tee slots. This type of construction permits the housing to be placed up against the work roll regardless of whether a wide or narrow section is being rolled. The machine is equipped with bronze bearings as standard but tapered roller bearings may be installed if so desired. Starting and stopping is through a built-in friction clutch the lever of which is located at a point convenient to reach from any point on the front of the machine. The motor is mounted under the bed. The size of sections to be rolled determines the advisability of installing a two-speed gear box. Additional equipment also includes a small high-speed cutoff saw which may be attached at the end of the unit. The type B machine is built in two sizes, capable of rolling sheets 10 and 14 inches wide and of 18 and 14 gage, respectively. Work spindles range from 2 to 14 and 2 to 12 on the two machines. The speed on the smaller machine is 100 to 200 feet per minute and on the larger 75 to 150 feet per minute.

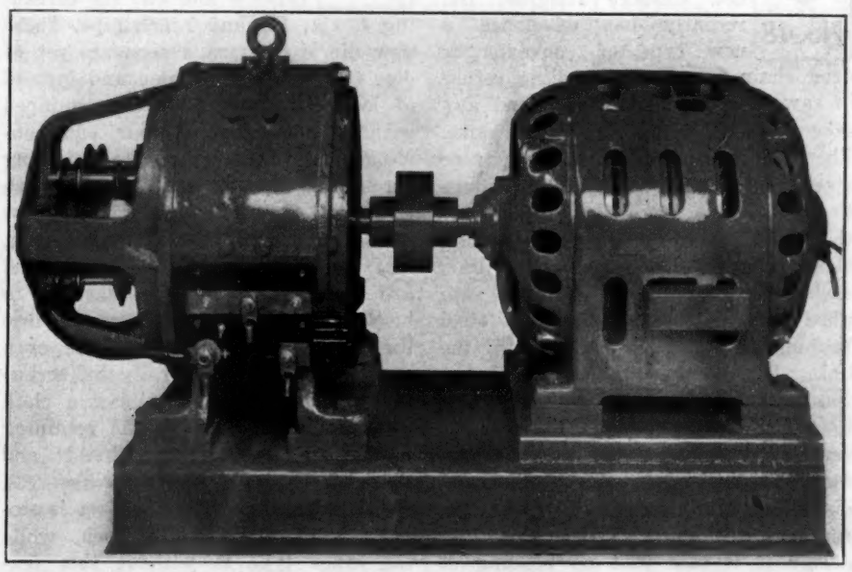
Universal Machine Larger

The type C or universal machine, shown in the accompanying illustration, employs the unit method of construction, each unit carrying two pairs of work spindles, and the parts interchangeable. By use of a link system the top spindles have an up and down adjustment of 5 inches with the gears always in mesh. This machine is larger than the type B machine with a two-speed gear box standard equipment. Guide supports are suspended from the top of the main housing by an adjusting screw and are movable up and down in a guide at the back. The universal machine is made in three standard sizes, capable of handling sheets 12, 16 and 20 inches wide, and 16, 14 and 10 gage. Each size machine may be equipped with from 2 to 20 pairs of work spindles ranging in diameter from 2 to 3 inches, depending upon the size of the machine.

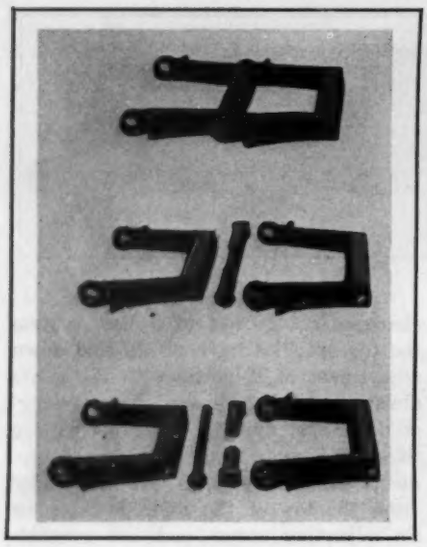
Motor-Generator Setups Have Welded Bases

No. 47

Reliance Electric & Engineering Co., 1042 Ivanhoe road, Cleveland, has adopted bases of heavy steel plate, electrically welded, for motor-generator sets which the company manufactures in sizes up to 250 kilowatts. The tops and ends of the welded base are closed completely so that no dirt can collect underneath them. The pads, upon which the motor and the generator rest, are lined up horizontally and vertically by using the ma-



No. 47—Motor-generator set mounted on steel pads welded to steel plate base



No. 48—Progressive steps in assembly of new manganese steel link for conveyor chain

chines themselves as patterns for doing the aligning. Such shims as are needed are placed between the pads and the base. The pads with the shims beneath then are welded to the base. Horizontal alignment is maintained by the use of tight fitting dowels. These are driven into the pads, through two diagonally opposite feet of each unit. One or more units may be removed from the base without disturbing the alignment when they are replaced. For special sets the welded construction is an aid to prompt delivery. The accompanying illustration shows one of the sets erected on the welded base.

Manganese Steel Links in Conveyor Chain

ITP No. 48

American Manganese Steel Co., Chicago Heights, Ill., recently has developed a new type of conveyor or drag chain for use in handling refuse in saw mills, cement clinker and any other material handled by drag chains. The links are made of manganese steel, imparting good wearing qualities and hence long life. In place of the usual steel pin or rivet running clear through the body of the link, each link of the new chain is supplied with two hollow manganese steel bushing pins, one for each eye of the link. These are held in place by the usual steel pin passing through them in the link barrel. This bushing arrangement enlarges the bearing surface and does away with bowing and distorting often encountered with the regular steel pins. With this new design it is said that no bending of the pin or bushings occurs and repair of the chain is facilitated. Various steps in the assembly of a link are shown in the accompanying illustration. The pintles of the chain will not bend or cut and can be reversed to restore the pitch, according to the manufacturer.

Elevator Drive Through Reducer and Chain

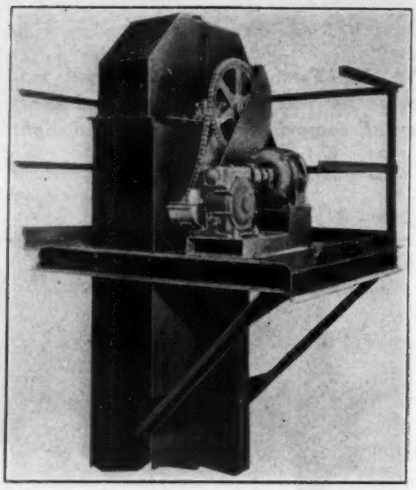
ITP No. 49

H. W. Caldwell & Son Co., 2410 West Eighteenth street, Chicago, announces a new standardized elevator drive, built to operate centrifugal discharge, perfect discharge or continuous bucket elevators requiring 3 to 15 horsepower. The entire line is standardized and carried in stock. The arrangement of the drive unit is shown in the accompanying illustration. The first reduction from the motor is a fully enclosed worm gear speed reducer to which the motor is connected through a flexible coupling. The motor and reducer are aligned accurately on a welded steel base and supported on a small platform of structural members attached to the elevator casing near the top. The second reduction in speed is through a roller chain and sprockets, also providing a flexible connection between the reducer and headshaft. An extra sprocket may be attached to an idler frame, and in turn be adjusted to compensate for changing the height of the elevator headshaft without cutting the roller chain.

Plain and Ratchet Die Stocks Announced

ITP No. 50

Borden Co., Warren, O., is placing on the market two new four-post die stocks, types 8 and 8R, for threading 1, 1¼, 1½ and 2-inch pipe. These new die stocks use a separate set of dies for each size of pipe and instead of loose bushings, they are equipped with a self-contained rear end consisting of three screws projecting through a collar into contact with the pipe. One screw is a grip screw with a cross pin 2 3/16 inches long. The other two are guide bolts and are grooved and set in place by a hardened steel washer dropped into the size desired. Die slots are open and may be cleaned easily by screwing up the head and wiping a cloth through the slots. The die retaining mechanism is fully enclosed and there are no exposed springs. A simple ratchet-pawl mechanism is provided with the 8R die stock, while the other type is without this feature. Net weight of the ratchet tool



No. 49—Bucket elevator drive consisting of motor, speed reducer and roller chain

is 12¾ pounds; of the plain, 9¼ pounds.

Large Uses of Steel in Small Ways

(*Concluded from Page* 48)

steels such as chrome-vanadium, chrome-molybdenum and silico-manganese steels is consumed in the manufacture of springs for operating the valves in automobile engines, diesel engines, rock drills, pneumatic hammers and equipment where they are required to resist as long as possible the destructive effects of high-speed operation, heat and impact, and sometimes all three.

A large number of small springs are made of music wire. Some of these are so fine that a pound of wire makes 30,000 springs.

The annual production of springs of the miscellaneous classes is reliably reported to exceed 100,000 tons a year, including a wide range of sizes and grades of steel, in the form of drawn wire, flat bands and strip.

In the manufacture of elliptic springs, such as used on automobiles, the stock is cut to length and formed between dies. The ends that accommodate shackle pin bushings are also formed in dies. Usually the "eyed" ends are ground between two disks on a double-head disk grinder. The springs then are heat treated.

Coil springs, both the open and closed types, are wound from coil wire in special spring-winding machines. The wire is coiled and cut off automatically. The ends of such springs generally are ground flat and true by locating a number in a holder which is passed between the grinding disks of a double-head disk grinder.

Editorials

Labor Strain Has Been Removed

VAST improvement in labor conditions in the iron and steel industry, especially since 1923 when steps were taken to abolish the 7-day week, are emphasized from time to time. The report of the Federal Council of the Churches of Christ in America, while purporting to be an indictment of the industry for its dereliction in this regard, merely directs attention to the remarkable progress toward humanizing labor. Two graduate students of the Boston University School of Technology, working under direction of the Federal Council, reported that 26.9 per cent of the men in the elemental steelmaking processes still work 7 days a week. The other 73.1 per cent work five to six days a week.

Fortunately, more competent authorities have studied the industry's hours of employment. President Hoover's Conference Committee on Recent Economic Changes in the United States, surveying the basic industries of the country, recently declared: "The largest reduction in hours seems to have been made in the iron and steel industry." And the federal bureau of labor statistics, periodically and comprehensively investigating the industry, declares the average of full-time hours per week in 1929, when steelmaking activity was a record, was 54.6.

The bureau's findings show an average reduction of 8.6 hours per week, or 13.6 per cent, since 1922, the year before the industry committed itself to eliminate the 7-day week. It found reductions of 16 per cent in the blast furnace department, 18.5 per cent in open-hearth furnace departments, 21.8 per cent at bessemer converters, 12.4 per cent at rail mills, and substantial reductions in all of the other departments.

The average 54.6 hours per week is equivalent to 9.1 hours per day for six days. Assuming that a small proportion of the half million employes of the industry do work seven days a week, the best statistics available show that the total number of hours in a week for the great majority of the workers is not excessive. The strain under which the men worked some years ago has been taken off, first through the honest, diligent efforts of the industry to eliminate the 7-day week, and secondly by the labor-saving equipment now generally in use.

Conditions today are greatly improved over those of seven years ago; a most casual examination of the facts reveals this. And what is more, they are likely to continue improving. The trend is so wholesomely and unreservedly upward that a reactionary report, intended to complain about what the steel industry has not done, has no constructive value at this time.

Western Sheet Sales Gage Activity

WITH automotive tonnage a relatively small factor in sheet steel sales of western independent mills, orders from widely diversified manufacturing lines are absorbing a growing volume of blue annealed sheets. At the same time, the tonnage of lighter gage sheet grades consumed in the markets served by those mills appears to be growing smaller.

Recovery in the sheet markets remains slow, but in the face of a generally unfavorable market situation, the tonnage of blue annealed sheets moving into diversified channels is outstanding in its gradual expansion. Being independent of the automotive industry to a large extent, and contributing in a small way to farm implement manufacture, this demand is characteristic of a consumer classification that is broadening its needs and is capable of maintaining a fairly steady balance in times of spotty demand from the more spectacular sources.

Business Expanding Despite Caution

THE rather sharp recovery in steel production since the first of the year has figured most prominently in references made to improvement in general industrial activity during that period, but other industries made a showing equally favorable.

Freight car loadings for the first four weeks of January were only 7 per cent below the five-year average for that month and 6.5 per cent less than during the corresponding 1929 period. Figures on miscellaneous freight and less-carload merchandise, which give the best cross-section of industrial activity, showed about the same decreases as did total loadings.

January building awards dropped 21 per cent below the volume a year ago but structural steel orders showed little decrease. An increase of 78

per cent in prospective building work for the month forecasts substantial improvement in coming months. January automobile production was off 25 per cent from 1929, but approximated the average for the past five years.

Steel production has made further gains since the first of February and it is not unlikely that it is forecasting a similar improvement in general business. In view of the close adherence to hand-to-mouth buying and of the caution of steelmakers regarding unwarranted expansion of production, the trend in ingot output should have more than its ordinary value as an indication of growing steel consumption and trade activity.

How Building Can Save $35,000,000

AS PROSPECTS for an active building season take form, building contractors are hopeful that a permanent tribunal for adjustment of the jurisdictional strife that perennially saddles itself on the building industry may result from the recent meeting in Tampa, Fla., and the conference of building trades representatives and builders shortly to be held in Washington.

The proposed adjustment board will stand on its ability to function with such fairness as to hold the respect of the building trades mechanics, and at the same time to reduce the needless loss to the building industry. Jurisdictional strife should be held in check while the plans for a permanent adjustment board are under way. Builders, usually reticent in estimating the economic loss of the jurisdictional disputes between trades, conservatively place the annual loss to the industry at $35,000,000. Machinery for reducing or eliminating this loss undoubtedly would stimulate building. Serving the building lines, the steel industry has a vital interest in the outcome.

Momentum Tides Corporation Over

NET earnings of the United States Steel Corp. for 1929, amounting to $19.96 a share on the common stock, without including the special income of $9,972,351 reported for the final quarter of the year, which made an equivalent of $21.18 a share, exceeded even the most optimistic estimates.

Of much interest in the corporation's financial report were the figures for the fourth quarter. Total earnings for the final three months of the year, although 25 per cent lower than in the preceding period, were the largest for any fourth quarter since 1917. In fact, they were larger than in any quarter since the war.

October earnings of $22,066,325 were close to the best monthly records of 1928, which was a good year. The December figures, however, amounting to only $15,951,902, were 28 per cent lower than for October and the smallest for any month since April, 1928.

The Corporation's record of monthly earnings did not fully reflect the 1920 depression until March, 1921. The business unsettlement in 1927, which occurred in the spring, had little effect on earnings until the following autumn. These comparisons indicate that the momentum of the Corporation's business tends to carry it through the bad periods.

Encouraging as the Corporation's report for the quarter and the year appears to be, it nevertheless is evident that monthly and quarterly profits are a somewhat delayed and modified reflection of events that have passed. These figures, merged in a trend with peaks and valleys partly flattened out, also tell the story of the past but in better perspective. The trend of earnings shows great improvement since 1926.

Will Walsh Recant, Like Webster?

ABOUT once a century Massachusetts appears to become aberrant on the tariff. In 1824 Daniel Webster, then a representative from the state, achieved undying oratorical renown in opposing Henry Clay's "American System" or protective tariff, but four years later he reversed himself on the ground New England was becoming industrial.

Now, in 1930, the Bay State's democratic senator at Washington—David I. Walsh—proposes to lower the duty on cast iron pipe from 30 per cent ad valorem to 20 per cent. This in spite of the fact that Massachusetts in 1928 was one of the two industrial states of the union to go democratic in the presidential election, when the democratic candidate reversed his party's historic position and advocated moderate protection.

At the moment Massachusetts is a large consumer of cast iron pipe and not a producer, but the latter situation will shortly be changed. A pipe foundry is now in process of construction near the Mystic stack at Everett, Mass., in the Boston area, while the French interests which only recently were low bidders on 3100 tons for Boston are contemplating erecting a New England plant to hurdle the tariff.

It is incongruous for industrial, urban Massachusetts, mother of a distinguished line of statesmen noted for their devotion to the principle of a protective tariff, to become aligned with free traders, especially since the state voted for protection in 1928 when both political parties were advocating it. Senator Walsh, like Webster in an earlier day, may find himself recanting.

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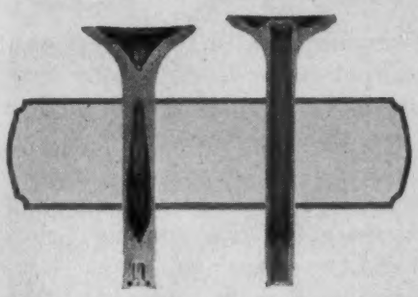

Alloy Steels Important in Manufacture of Redesigned Aircraft Engine Valves. Page 39.

Constructive Features Outweigh Destructive

CONSTRUCTIVE factors dominate in the present economic picture, notwithstanding over-played "demonstrations" by a few communist leaders in several cities recently, and Federal Council of Churches report coming at an ill-starred time to the effect that a large percentage of workers in the iron and steel industry continue on a seven-day week basis. To the constructive factors IRON TRADE REVIEW *addresses itself, and in this issue, page 54, will be found a resume of the large-scale projects for expansions in the steel industry. As for the Federal Council's report, little need be said. Vast improvement has been made in labor conditions, and officially recognized in government reports. To an impartial observer it appears a few college students were sent out to heckle an industry whose management and sound policies have been at the root of American material and spiritual welfare.*

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The Business Trend

Pace of Business Recovery Is Not Rapid

REPORTS from the leading industries this week indicate that the march of business toward better times is painfully slow. In the main, prospects are encouraging, but until they materialize, industry will continue at its present far from satisfactory pace. With half of the first quarter now past it is evident that recovery will be retarded, despite a spring bulge.

OVERPRODUCTION in 1929 probably was greater than generally realized at the beginning of 1930. Liquidation of supplies of certain commodities is not complete. Prices of many comcodities have not reached stabilization levels.

ON THE other hand there is additional evidence that the bottom of the decline has been reached, clearing the way for revival. The steel industry, one of the first to turn, holds its own against rather light demands from the automotive manufacturers.

JANUARY construction awards, according to the F. W. Dodge Corp., totaled 32,930,000 square feet, a new low level, comparing with 44,007,800 square feet in December and 95,250,000 in May, 1928. Large projects are contemplated.

AUTOMOBILE producers, with few exceptions, are holding output below levels of one year ago. Most producers are running on higher schedules than a month ago, however.

REVENUE freight car loadings are showing a seasonal increase but are running below levels of both one and two years ago. Bank clearings, cotton consumption, foreign trade and other current statistics all show declines.

IN THE week ended Feb. 1 the railroads handled 898,894 loaded cars, the American Railway association reports. This was an increase of 36,273 cars compared with the previous week but it was 11,000 below the average for January, 1929.

ON THE constructive side of the business outlook is the better credit situation, moderate recovery during the past few days of some of the commodity markets such as wheat and cotton, gradually rising employment and the approach of spring with its seasonal demands.

BUSINESS is subnormal and recovery is spotty. The worst fears, nevertheless, have been dissipated. Sentiment is cheerful and improving.

The Barometer of Business

INDUSTRIAL INDICATORS

	January, 1930	One month ago	One year ago	Average 1913
Pig iron output (Daily average, tons)	91,565	91,513	110,742	83,900
Foundry Equipment orders 3-Mos. average	165.6	193.9	181.6	.....
Unfilled orders (tons)..	4,468,710	4,417,193	4,109,487	4,513,000
Ingot output (Daily average, tons).....	140,234	115,851	166,309	.....
Dodge Bldg. awards in 37 states (sq. ft.)	32,930,000	44,007,800	58,773,900	.....
Automobile output*.....	300,000	120,000	234,000	.....
Coal output, tons.....	49,750,000	46,202,000	51,456	39,869,000
Business failures; number	2,759	2,037	2,535	1,336
Business failures; liabilities	$61,185,171	$67,465,114	$47,634,411	$22,732,000
Cement production, Bbls.	.....	11,215,000	12,189,000	7,704,000
Cotton consumption bales	577,235	453,892	668,286	438,218
Car loadings (weekly average)	848,000	835,000	888,000	.....

*Estimated.

FOREIGN TRADE

	One month ago	One year ago	Average 1913
Exports	$417,000,000	$426,595,630	$487,000,000	$194,000,000
Imports	$312,000,000	$310,572,556	$256,000,000	$149,900,000
Gold exports	$8,948,000	$72,547,000	$1,378,000	$5,284,000
Gold imports	$12,908,000	$8,121,000	$48,577,000	$5,900,000

FOREIGN EXCHANGE

	Normal	Feb. 16	One month ago	One year ago
Sterling	$4.86	$4.86	$4.86	$4.85
Francs	19.30c	3.91c	3.92c	3.90c
Lira	5.26c	5.23c	5.23c	5.23c
Marks	23.8c	23.86c	23.88c	23.71c

FINANCIAL INDICATORS

		One month ago	One year ago	1913
25 industrial stocks*	$315.49	$284.92	$339.51	$58.19
25 Rail stocks*.....	$132.49	$125.59	$128.46	$82.90
40 bonds*.....	$87.13	$86.65	$89.51	$93.00
Bank clearings (000 omitted)	$50,787,011	$52,578,985	$65,287,754	$13,895,000
Commercial paper rate N. Y., (per cent).....	4¾ to 5	4¾	5½ to 5¾	5.60
*Commercial loans (000 omitted)	$8,995,000,000	$9,044,000,000	$9,315,000,000	.....
Federal Reserve ratio, per cent	77.9	75.4	69.8	.....
Railroad earnings	$73,602,000	$86,669,467	$94,385,667	$59,301,000
Stock sales, N. Y. stock exchange.....	62,308,290	83,861,660	110,803,940	6,924,000
Bond sales, par value..	$207,699,700	$277,086,850	$247,723,200	$41,499,000

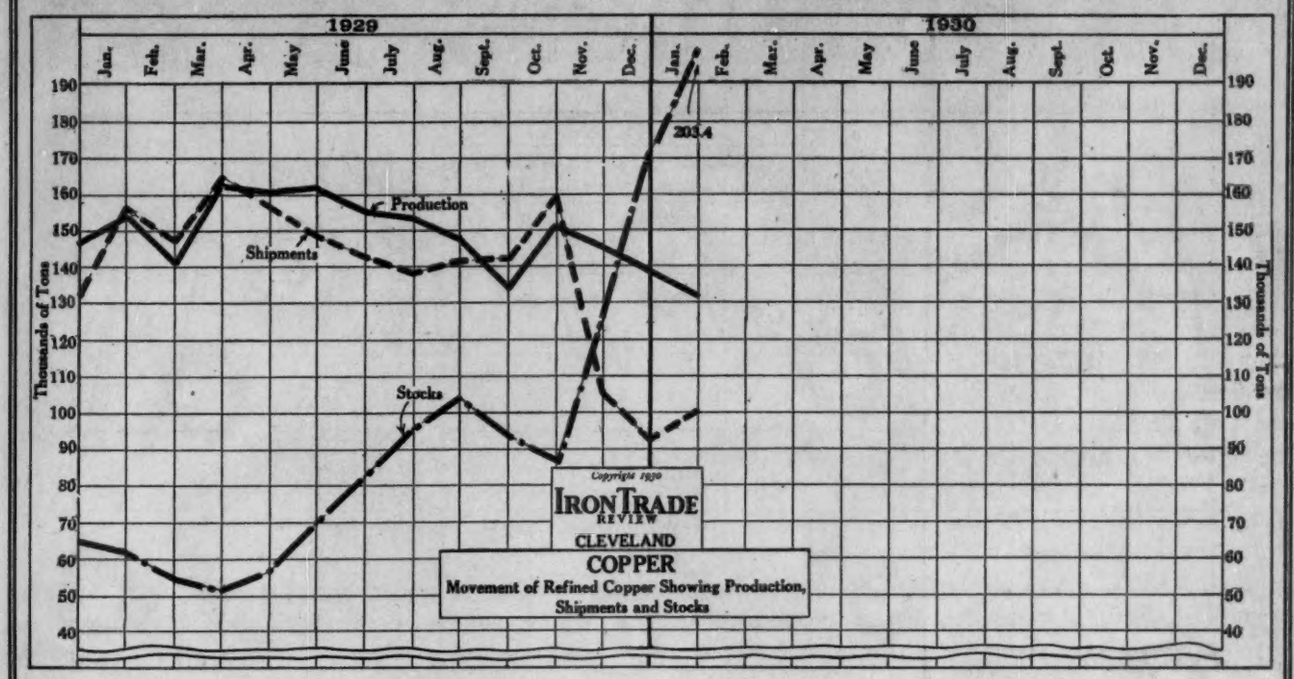
*Feb. 15.

**Leading member banks Federal Reserve System.

COMMODITY PRICES

		One month ago	One year ago	1913
IRON TRADE REVIEW composite average of 14 iron and steel prices	$35.56	$35.95	$36.24	$26.32
Bradstreet's index.....	$11.51	$11.67	$12.98	100
Wheat, cash (bushel).....	$ 1.35	$ 1.22	$ 1.30	92c
Corn, cash (bushel).....	$ 1.03	$ 0.89	$ 0.96	54c
Petroleum, crude (Bbl.)	$ 3.00	$ 3.05	$ 4.10	$ 2.50

The Business Trend

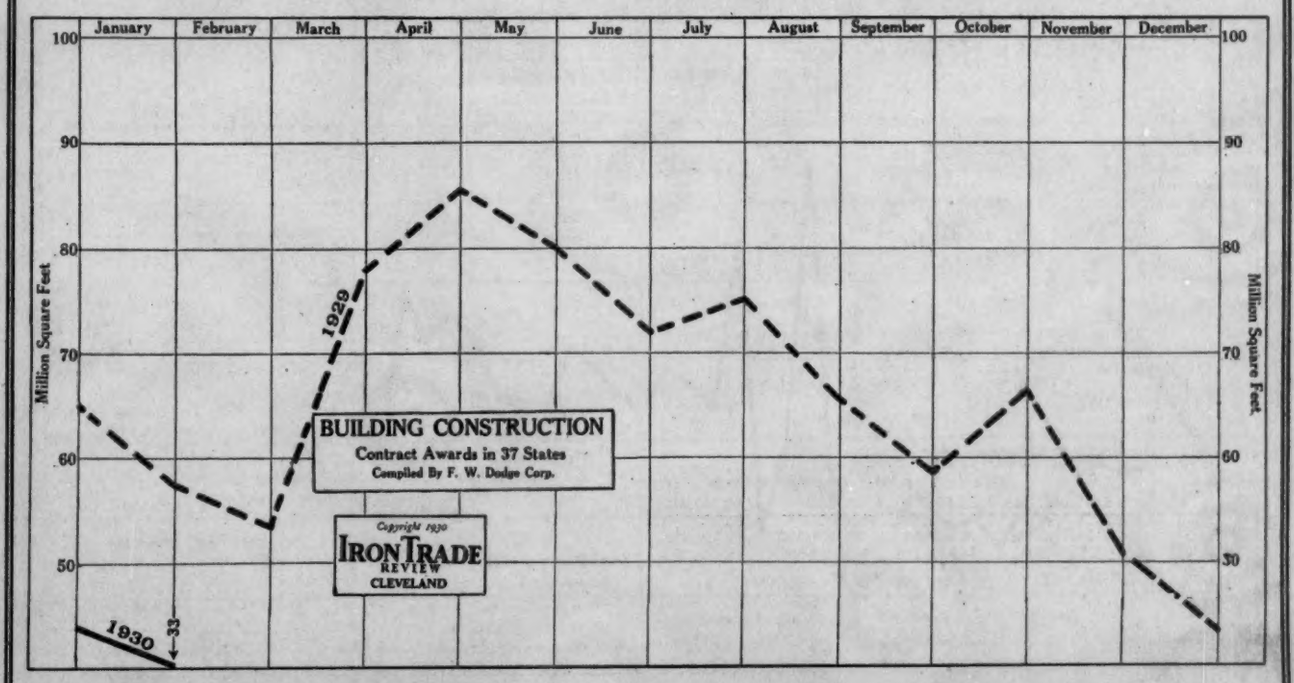


Refined Copper

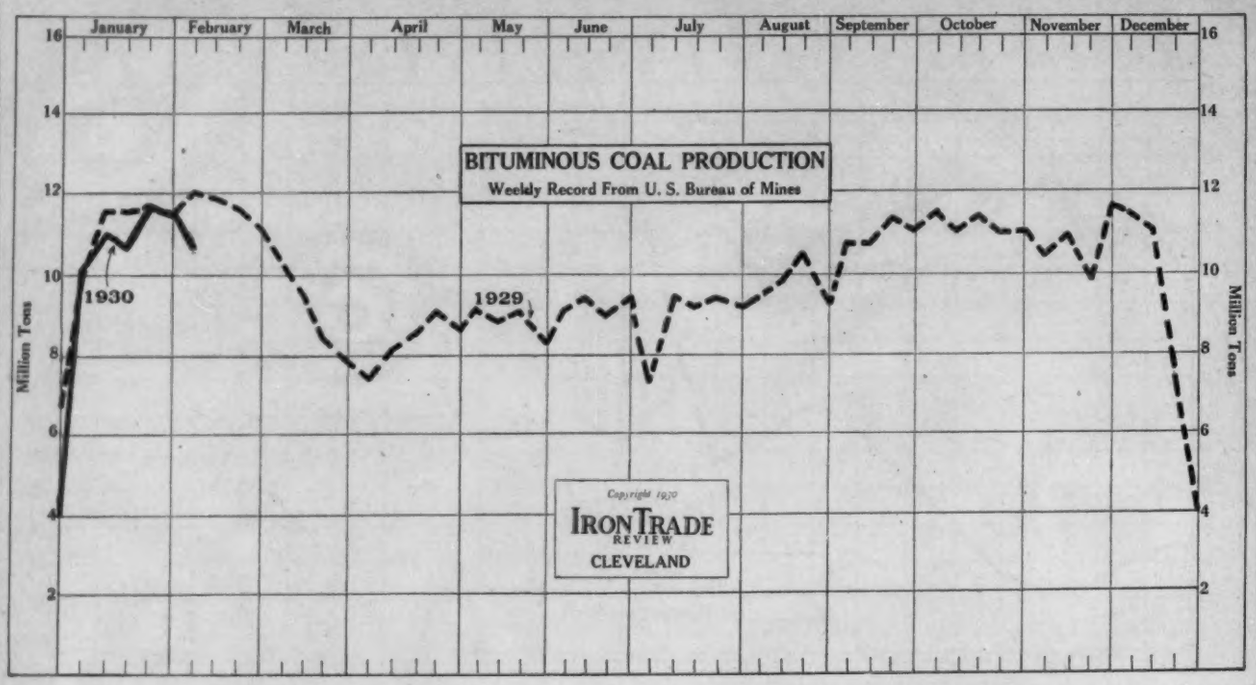
TOTAL stocks of refined copper in the hands of producers in North and South America at the end of January were the largest in more than 7½ years, according to the American Bureau of Metal Statistics. Stocks totaled 203,404 tons, an increase of 32,084 tons, or 18 per cent. Copper production declined from an average daily rate of 4964 tons in December to 4270 tons in January, or about 4 per cent. January shipments of 100,290 tons compare with 93,802 in December and 157,189 tons a year ago.

Building Construction

BUILDING construction activity in January, as measured by the F. W. Dodge Corp.'s compilation of awards in square feet, dropped to a new low level despite contemplation of many new projects. January awards totaled 32,930,000 square feet compared with 44,007,800 in December and 58,773,900 in January last year. Compared with one year ago the decline was 27 per cent and compared with two years ago, 45 per cent. Building awards in May, 1928, reached the high total of 95,250,000 square feet.



The Business Trend

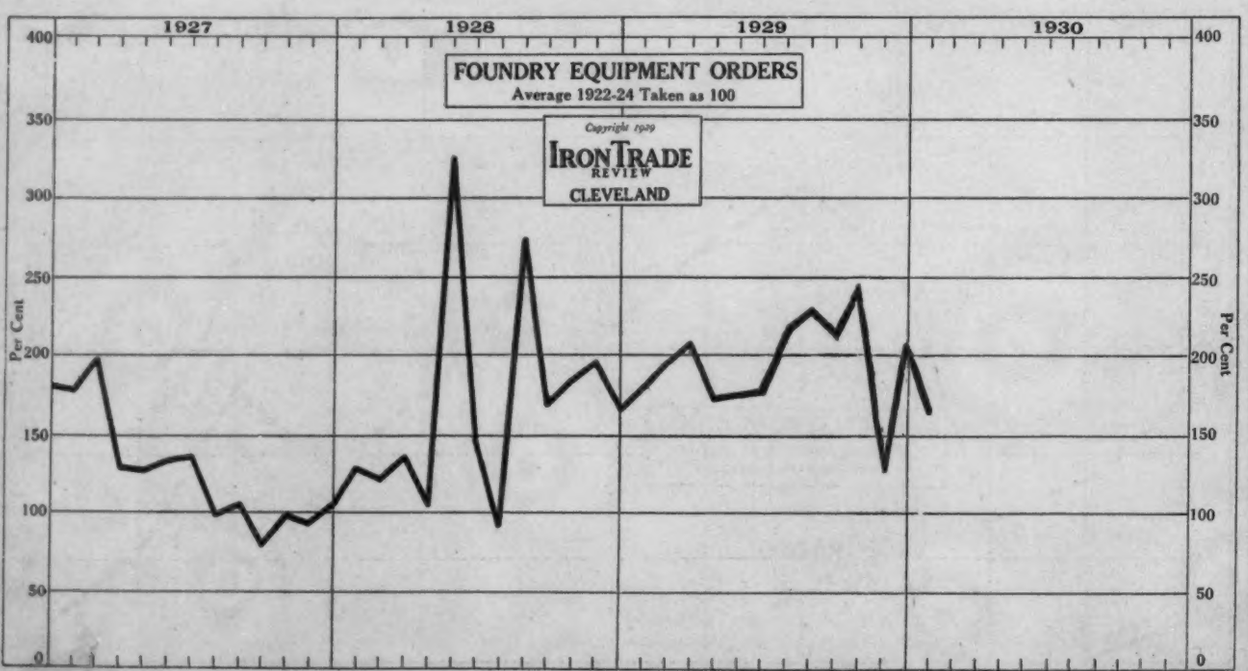


Coal Production

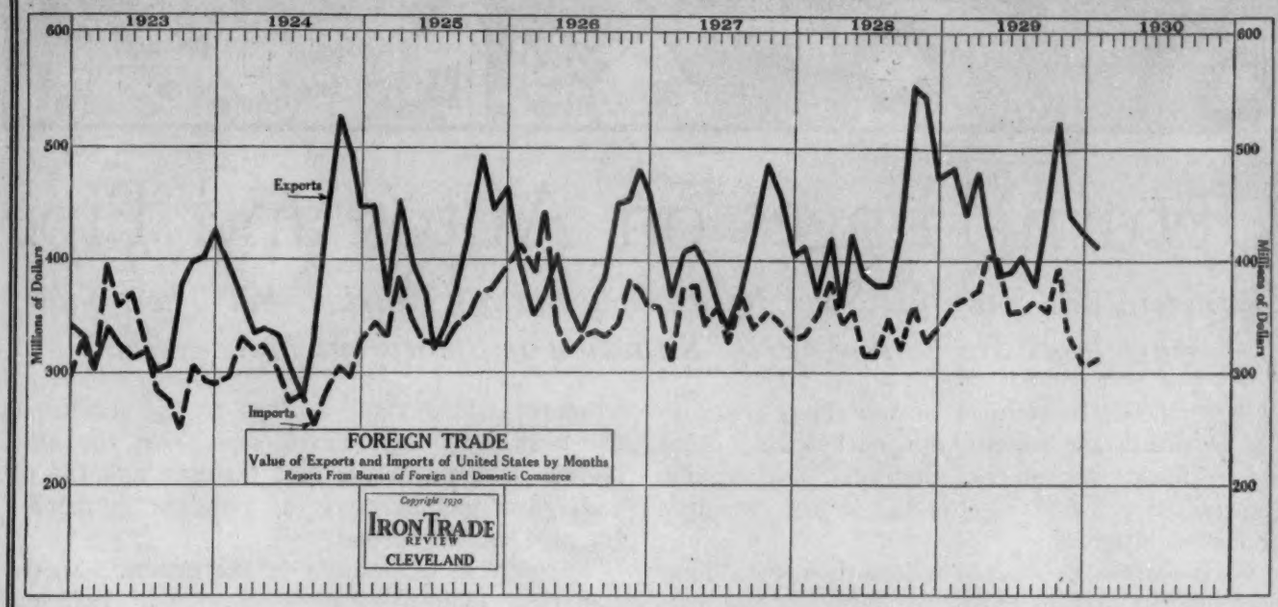
PRODUCTION of bituminous coal is falling below the rate of one year ago. Output in the week ended Feb. 8 was 10,936,000 tons compared with 12,070,000 tons in the corresponding period of last year, the United States bureau of mines estimates. The average daily rate of output was 1,823,000 tons against 2,012,000 tons one year ago. Production in 1929 was about 5 per cent above the 10-year average. With industrial demand curtailed, supplies of bituminous coal are plentiful.

Foundry Equipment

NOT since July, 1928, has the Foundry Equipment Manufacturers' association reported gross orders so low as for January, 1930. The association's index last month was 160.1 compared with 208 for the previous month and 180.5 for January, 1929. The January index on a three months' average basis was 165.6 compared with 193.9 for December and 181.6 for January, 1929. The index of shipments increased from 201.9 for December to 223.6 for January. The unfilled orders index dropped 77.6 to 395.6.



The Business Trend

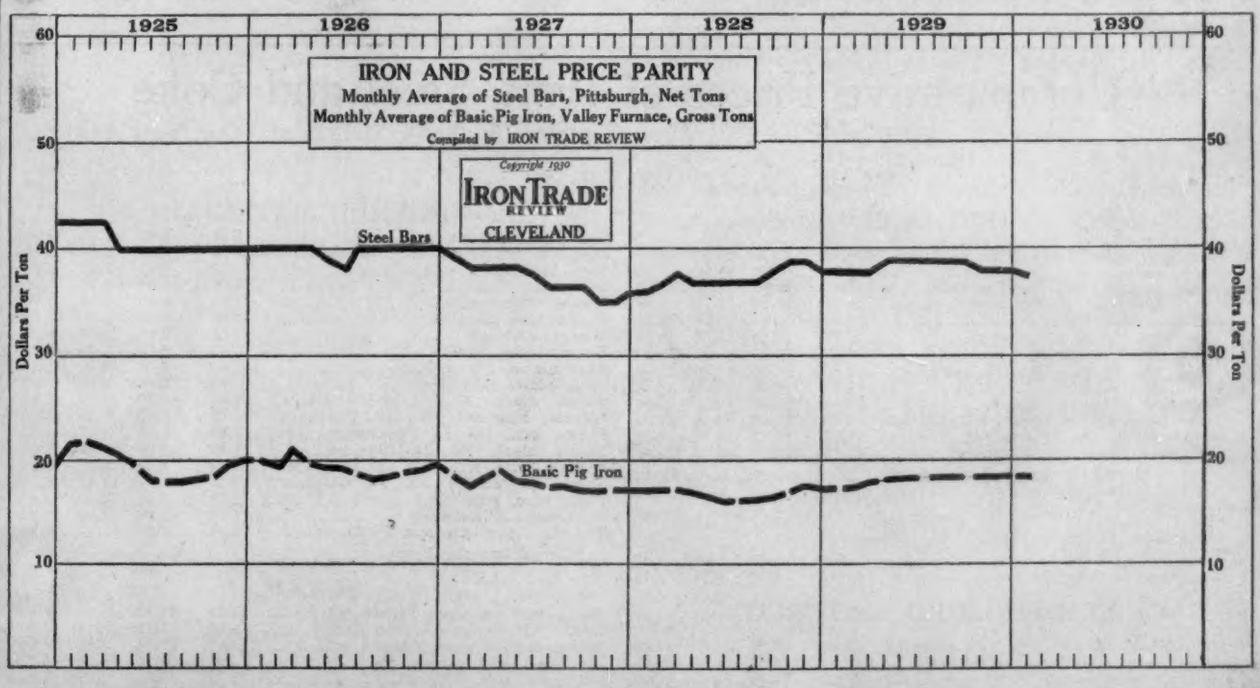


Foreign Trade

MERCHANDISE exports from the United States in January totaled $417,000,000, a decrease of $9,646,000 compared with the previous month, according to the department of commerce. Imports were $312,000,000, a gain of $3,000,000 compared with those for December but $56,000,000 below those for January one year ago. Exports last month were valued at $70,000,000 less than in January, 1929. Last month's favorable trade balance was $105,000,000 compared with $119,000,000 one year before.

Iron and Steel Price Parity

DURING January the average price of steel bars at Pittsburg declined 50 cents a ton to $37.50. Basic pig iron continued unchanged at $18.50, valley, for the eighth consecutive month. Steel bars held at $39 a ton through the second and third quarters of 1929, dropping to an average of $38 in October. Pig iron prices strengthened more slowly than prices of bars. The current price spread between these two commodities is narrower than at various periods in the past.



Upturn Hinges on Autos and Pipe

Railroad and Building Steel Needs Now Sustain Market, but Their Support Is at Maximum—Price Situation Is Spotty but More Stable

WHETHER railroad and building requirements can sustain the market until other major consumers, especially the automotive industry, come back is the key to the iron and steel situation.

On the whole, producers believe they will. They appraise the present halting condition of the market as the usual vagary of February in demand and production. They look for the month to be a corridor between a fair January and the spring upturn normally starting in March.

Carriers' Needs Heavy Through May

Nevertheless, producers are not unmindful of the fact that the support of the railroads is now at its maximum. Through May specifications for track material and car and locomotive steel will be high, but there will be practically no replacement of this tonnage. Likewise, much of the structural material for spring building projects already has been placed.

With the general manufacturing trade proceeding cautiously, it is increasingly apparent that whatever added vigor accrues to the market in the next sixty days must come from the automotive industry in the first instance and the oil, water and gas industry, as reflected in demand for pipe, in the second.

There is no diminution of the general expectation that 1930 will be the reverse of 1929 and build up to a market climax rather than achieve it in the early months, but some who were optimistic when January opened so briskly now expect the process to be slower. Considered in relation to postwar conditions, 1930 may be nearer a "normal" year than 1929. Indeed, despite the poor showing as contrasted with a year ago, current pig iron production measures up to the average of the last ten Februaries, while the steel ingot rate is 15 per cent ahead.

Consider Advances for Second Quarter

Determination to advance prices for the second quarter is manifest, especially among the flat-rolled steel interests, as failure to regain shortly the ground lost last month means post-

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Feb. 19. 1930	Jan. 1930	Nov. 1929	Feb. 1929
PIG IRON				
Bessemer, del. Pittsburgh	$20.76	20.76	20.76	19.86
Basic, valley	18.50	18.50	18.50	17.50
Basic, eastern, del. eastern Pa.	19.00	19.20	19.75	20.50
No. 2 foundry, del. Pittsburgh	19.76	19.76	19.76	19.26
No. 2 foundry, Chicago	20.00	20.00	20.00	20.00
*Southern No. 2, Birmingham	15.00	14.70	14.00	16.50
**No. 2X, Virginia Furnace	18.25	18.25	18.25	21.25
**No. 2X, Eastern del. Philadelphia	21.26	21.56	22.26	22.01
Malleable, valley	19.00	19.00	19.00	18.00
Malleable, Chicago	20.00	20.00	20.00	20.00
Lake Superior, charcoal, del. Chicago	27.04	27.04	27.04	27.04
†Gray forge, del. Pittsburgh	19.13	19.13	19.13	18.76
Ferromanganese, del. Pittsburgh	103.79	104.79	109.79	109.79

*1.75 to 2.25 silicon. For local delivery, Northern shipments based on $13 to $14, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.60	2.55	2.65	2.90
Connellsville foundry, ovens	3.50	3.50	3.55	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	33.00	33.80	35.00	34.25
Sheet bars, open-hearth, Pittsburgh	33.00	33.80	35.00	34.25
Billets, open-hearth, Pittsburgh	33.00	33.80	35.00	33.25
Wire rods, Pittsburgh	40.00	40.00	40.00	42.00

	Feb. 19. 1930	Jan. 1930	Nov. 1929	Feb. 1929
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.85	1.90	1.90	1.90
Steel bars, Chicago	1.95	2.00	2.00	2.00
Steel bars, Philadelphia	2.17	2.17	2.22	2.27
Iron bars, Chicago	1.95	2.00	2.00	2.05
Shapes, Pittsburgh	1.85	1.90	1.90	1.90
Shapes, Philadelphia	1.86	1.91	1.96	2.01
Shapes, Chicago	1.95	2.00	2.00	2.00
Tank plates, Pittsburgh	1.85	1.90	1.90	1.90
Tank plates, Philadelphia	2.00	2.05	2.10	2.10
Tank plates, Chicago	1.95	2.00	2.00	2.00
Sheets, black, No. 24, Pittsburgh	2.65	2.70	2.75	2.85
*Sheets, blue anl., No. 13, Pittsburgh	2.25	2.30	2.35	2.10
Sheets, gal., No. 24, Pittsburgh	3.30	3.35	3.45	3.60
Sheets, black, No. 24, Chicago	2.80	2.90	2.95	3.00
*Sheets, blue anl., No. 13, Chicago	2.50	2.50	2.50	2.25
Sheets, galvanized, No. 24, Chicago	3.45	3.55	3.65	3.75
Plain wire, Pittsburgh	2.40	2.40	2.40	2.50
Wire nails, Pittsburgh	2.30	2.35	2.40	2.65
Tin plate, per base box, Pittsburgh	5.25	5.25	5.35	5.35

*Comparison for February, 1929, is with old blue annealed base, No. 10.

SCRAP				
Heavy melting steel, Pittsburgh	17.00	16.55	16.30	18.60
Heavy melting steel, eastern Pa.	14.50	14.50	15.13	16.30
Heavy melting steel, Chicago	13.50	12.65	13.05	16.00
No. 1 wrought, eastern Pa.	15.25	15.25	16.25	16.25
No. 1 wrought, Chicago	13.75	13.40	13.85	15.75
Rails for rolling, Chicago	14.75	14.65	15.30	17.50

Current Prices for Rolled Steel Products

STEEL PLATES

Pittsburgh, base	1.80c to 1.85c
Philadelphia, del.	2.00c to 2.10c
New York, del.	2.05c to 2.175c
Boston, del.	2.165c to 2.265c
Chicago, base	1.95c to 2.00c
Cleveland, delivered	2.04c
Lackawanna, N. Y., base	2.05c to 2.15c
Birmingham, base	2.00c to 2.05c
Coatesville, Pa., base	2.00c to 2.05c
Pacific Coast, c.i.f.	2.30c
St. Louis, del.	2.17c
Detroit, del.	2.09c to 2.14c

STRUCTURAL SHAPES

Pittsburgh, base	1.80c to 1.85c
Philadelphia, del.	1.86c to 1.96c
New York, del.	2.045c to 2.145c
Boston, del.	2.165c to 2.265c
Chicago, base	1.95c to 2.00c
Cleveland, delivered	2.04c
Lackawanna, N. Y.	2.05c to 2.15c
Birmingham, base	2.00c to 2.05c
Bethlehem, Pa., base	2.00c to 2.10c
Pacific Coast, c.i.f.	2.35c
Detroit, del.	2.09c to 2.14c

BARS

SOFT STEEL

Pittsburgh, base	1.80c to 1.90c
Chicago, base	1.95c to 2.00c
Birmingham, base	2.00c to 2.05c
Lackawanna, N. Y., base	2.00c to 2.05c
Pacific Coast, c.i.f.	2.35c
Cleveland base, local mills	1.85c
Cleveland, del., outside mills	1.875c
Philadelphia, del.	2.17c to 2.22c
New York, delivered	2.19c to 2.24c
Boston, delivered	2.165c to 2.265c
Detroit, del.	2.085c
Pittsburgh, cold finishing	1.90c to 2.00c
Pittsburgh, forging quality	2.05c to 2.15c

RAIL STEEL

Chicago Heights	1.85c to 1.90c
Eastern mills	1.85c to 1.95c

IRON

Chicago, base	1.95c to 2.00c
New York, delivered	2.19c
Philadelphia, delivered	2.17c to 2.22c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh, billet, cut lengths	2.20c
Stock lengths from mill	1.95c
Chicago, billet, 30 tons and over	2.00c
Under 30 tons	2.40c
Chicago, rail steel	1.80c to 1.85c
Road and bridge work	1.90c to 2.00c
Philadelphia, cut lengths	2.42c to 2.62c

CORROSION, HEAT RESISTANT ALLOYS

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel

Sheets....35.00c; plates....31.00c; bars....28.00c

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	22c	23.5c	26c	31c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

SHEETS

SHEET MILL BLACK, NO. 24

Pittsburgh, base	2.55c to 2.75c
Detroit, delivered	2.84c
Philadelphia, delivered	2.97c to 3.07c
Gary, Indiana Harbor	2.75c to 2.85c
Chicago, delivered	2.80c to 2.90c
Birmingham, base	2.90c
St. Louis, del.	3.17c

TIN MILL BLACK NO. 28

Pittsburgh, base	2.90c to 3.00c
Gary, base	3.00c to 3.10c

GALVANIZED NO. 24

Pittsburgh, base	3.30c
Philadelphia, delivered	3.62c to 3.72c
Gary, Indiana Harbor	3.40c to 3.50c
Chicago, delivered	3.45c to 3.55c
Birmingham, base	3.45c to 3.50c
St. Louis, del.	3.72c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base	2.25c
Chicago, district mills	2.45c
Chicago, delivered	2.50c
St. Louis, delivered	2.67c
Philadelphia, delivered	2.57c
Birmingham	2.45c to 2.50c

BLUE ANNEALED PLATES, NO. 9-10

Pittsburgh, base	2.10c
Chicago district mills	2.30c
Chicago, delivered	2.35c
Philadelphia, delivered	2.42c
St. Louis, delivered	2.52c
Birmingham	2.30c to 2.35c

AUTOMOBILE, NO. 20

Pittsburgh, base	3.90c
Detroit, delivered	4.09c to 4.19c

FURNITURE

Pittsburgh	3.90c to 4.00c

(Turn to the following page)

ponement of the effort until fall. Concessions are less frequent in sheets and strip, except to the automotive trade. More irregularities have appeared in plates and shapes in some districts, increasing the spotty effect of the heavy finished steel market, but to the general trade bars, plates and shapes are on the basis of 1.85c, Pittsburgh.

Structural steel awards this week at 34,000 tons show a reduction from the 60,662 tons of last week but exceed the 21,500 tons of a year ago. Bridge work continues an important factor, with an 11,000-ton office building and a 4500-ton subway section let in New York.

February purchases of freight cars passed 16,400, the largest since October, when the Louisville & Nashville placed 1800. Canadian Pacific has ordered 500, including passenger. Pending passenger car inquiry at 275 is the heaviest in months. Chicago mills have booked 12,500 tons of rails and 12,000 tons of track fastenings.

Tank Inquiry Extensive at Chicago

Ten thousand tons additional inquiry for tanks has come out at Chicago, making 30,000 to 35,000 tons pending there. Manufacturers' wire sales are fair in all districts, while nail demand lags. Sheet buying is spotty, being lower this week at Youngstown and higher at Pittsburgh. Line pipe is more active, some large inquiries promising to mature and 49 miles of 20-inch line for Cities Service Co. subsidiaries being booked by the A. O. Smith Corp.

Shipments of pig iron continue to expand moderately, with small sales being made for second quarter. Pig iron generally presents a more stable, solid market than finished steel. Prices on pig iron are unchanged save for a $1 reduction in Canada. Coke continues dull and unchanged. Scrap dealers are more confident. Some producers are piling semifinished steel.

Operate 10 Per Cent Below 1929

Steel corporation subsidiaries this week are at 85-86 per cent, against 83 last week and 90 a year ago. Independent producers are at 77 per cent, compared with 76 last week and 86 a year ago. This places the entire industry at 81 per cent, contrasted with 79-80 a week ago and 88 a year ago. Chicago mills are close to 90 per cent, Pittsburgh at 75, Youngstown at 76 and Buffalo at 74. At Cleveland 30 out of 34 open hearths are active.

With European iron and steel markets quiet, producers abroad are bending their energies to consummating mergers and perfecting selling syndicates. Reports that American producers who are large factors in the export field will join European interests in a cartel to stabilize international competition and prices are apparently founded more on hope than on fact at this time.

Composite Market Average

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (February 19, 1930)	$35.24
Last week (February 12, 1930)	35.24
One month ago (January, 1930)	35.56
Three months ago (November, 1929)	36.03
One year ago (February, 1929)	36.28
Ten years ago (February, 1920)	65.63
Fifteen years ago (February, 1915)	22.21

For the fourth consecutive week the IRON TRADE REVIEW composite of 14 leading iron and steel products stands at $35.24, indicating the downward price movement is near bottom. This compares with $35.56 last month.

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

Tubular Products Quoted on Last Editorial Page—See Preceding Page For Other Products

HOOPS, BANDS, STRIPS

Hot strip, to 6-in., Pitts.	1.90c
Delivered Detroit	2.09c to 2.19c
Hot strip 6 1/8 to 24-in., Pitts.	1.80c
Delivered Detroit	2.09c
Hot strip, bands 6 in. and under, Chicago	2.00c
Do. 6 1/8 to 24	1.90c
Cooperage stocks, Pittsburgh	2.10c
Do, Chicago	2.30c
Cold rolled strip, hard coils, 16 inches and under by 0.100-inch and heavier, base Pitts., Cleve. (3 tons and over)	2.65c to 2.70c
Delivered, Detroit	2.885c
Worcester, Mass. (3 tons and over)	2.80c to 2.90c

ALLOY STEEL

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E. Series Number	Alloy differentials	Net 100 lb. bars
2000	0.25	$2.90
2100	0.55	3.20
2300	1.50	4.15
2500	2.25	4.90
3100	0.55	3.20
3200	1.35	4.00
3300	3.80	6.45
3400	3.20	5.85
4100 0.15-0.25 Mo.	0.50	3.15
4100 0.25-0.40 Mo.	0.70	3.35
4600 0.20-0.30 Mo. 125-1.75 Ni.	1.05	3.70
5100 0.60-0.90 Cr.	0.35	3.00
5100 0.80-1.10 Cr.	0.45	3.10
5100 Chrome Spring	0.20	2.85
6100 Bars	1.20	3.85
6100 Spring Steel	0.95	3.60
Chrome Nickel Vanadium	1.50	4.15
Carbon Vanadium	0.95	3.60
9250 (flats)	0.25	2.90
9250 (rounds, squares)	0.50	3.15

Hot rolled alloy billets 4 x 4-inch and over take same prices per gross ton as same specification alloys bars per net ton. Sizes under 4 x 4 to 2½ in. x 2½ in. inclusive sold on bar basis plus steel bar card extras for size. Sizes under 2½ in. x 2½ in. take bar price on net ton basis.

COLD FINISHED STEEL

Bars, drawn or rolled, Pitts., Chi., Buffalo, and Cleve. c.l.	2.10c
Do, delivered, Detroit	2.335c
Shafting (turned, polished) Pittsburgh, Buffalo	2.10c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.45c to 2.90c

WIRE PRODUCTS

F.o.b. Pittsburgh, Cleveland base
(Per 100 pound keg)
(To Merchant Trade)

Standard wire nails	$2.30
Cement coated nails	2.30
Galvanized nails	4.30
(Per pound)	
Polished staples	2.75c
Galvanized staples	3.00c
Barbed wire, galvanized	2.95c
Annealed fence wire	2.45c
Galvanized wire	2.90c

Anderson, Ind., $1 higher. Chicago $2 higher, Duluth, Birmingham $3 higher.

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Bright plain wire, 6 to 9 gage	2.40c
Spring wire	3.40c
Wire, delivered Detroit	2.535c
Nails, delivered Detroit	2.535c

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Pittsburgh-Cleveland base on products made there; Duluth $2 higher; Fairfield, Ala., $3 higher.

CUT NAILS, CHAIN, PILING

Cut nails, c.l., f.o.b. mills	2.55c
Cut nails, l.c.l., f.o.b. mills	265c
Sheet piling, base, Pittsburgh	2.20c

Chain proof BB and BBB, Pitts.

3/16-in. to ½-in.	33 1/3 and 5 off
9/16-in. to 1½-in.	33 1/3 off

CAST IRON WATER PIPE

Class B Pipe—Per Net Ton

Six-inch and over, Birming'm	$37.00 to 38.00
Four-inch, Birmingham	41.00 to 42.00
Four-inch, Chicago	49.20 to 50.20
Six-inch to 24-inch, Chicago	45.20 to 46.20
Six-inch and over, New York	38.50 to 40.50
Four-inch, New York	41.50 to 42.50
Standard fittings, Bir. base	$100.00

Six to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B.

TIN PLATE; TERNE PLATE

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.25
Gary, Ind., base 10 cents higher.	
Long ternes, primes, No. 24	3.90c

*Price subject to quantity differentials.

WASHERS

Wrought, c.l., Pitts. dist.	$6.50 to 6.75 off
Wrought, l.c.l., Chicago dist.	$6.80 to 6.90 off
Wrought, c.l., Chicago	$7.00 to 7.10 off

RAILS, TRACK MATERIAL

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$25.00 to 29.00
Light rails, 25 to 45, mills	$36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, mills	2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts.	2.80c
Spikes, boat and barge, Pitts.	3.00c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts., steam roads	3.80c
Track bolts, Pitts., stand. jobbers	70 off list
Track bolts, Chicago	3.80c
Tie plates, mills	$41.50

BOLTS AND NUTS

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927. Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS

All sizes, cut thread	60 to 70 off
Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.	
Eagle list	60 to 70 off

MACHINE BOLTS

All sizes, cut thread	60 to 70 off
Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.	
Lag screws	60 to 70 off
Plow bolts, Nos. 1-2-3-7 heads	60 to 70 off
Tap bolts	60 to 70 off
Blank bolts	60 to 70 off
Stud bolts without nuts	60 to 70 off
Stove bolts, 75, 20, 10 and 5 off in pkgs., 75, 20, 10 and 5 with 2½ off in bulk.	
Tire bolts	60-5 off

Nuts

Semifinished	60 to 70 off

HEXAGON CAP SCREWS

Milled	80-10-5 off
Upset 1 in. diam. and smaller	85 off

SQUARE HEAD SET SCREWS

Milled	80-5 off
Upset 1 in. diam. and smaller	80-10-5 off

RIVETS

Struc., c.l., Pitts.-Cleve.	3.10c
Structural, c.l., Chicago	3.20c
**7/16-inch and smaller, Pitts.	70 and 10 off
Chi., Cleve.	70 to 70 and 10 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Raw Materials and Semifinished Products

SEMIFINISHED STEEL

Prices Per Gross Ton

BILLETS AND BLOOMS
4 x 4-inch base

Pittsburgh, open-hearth	$33.00
Pittsburgh, bessemer	33.00
Youngstown	33.00
Cleveland	33.00
Philadelphia	38.30 to 39.30
Chicago	35.00
Forging, Chicago	40.00
Forging, Pittsburgh	39.00
Forging, Philadelphia	43.30 to 44.30

SHEET BARS

Pittsburgh	$33.00
Youngstown	33.00
Cleveland	33.00
Chicago	35.00

SLABS

Pitts., Young.	$33.00
Cleveland	33.00

WIRE RODS

Pittsburgh, Cleveland	$40.00
Chicago	41.00
Youngstown	40.00

SKELP

All grades, Pittsburgh	1.85c

IRON ORE

LAKE SUPERIOR ORE
Per Gross Ton, Lower Lake Ports

Old range bessemer, 51½%	$4.80
Mesabi bessemer, 51½%	4.65
Old range nonbessemer, 51½%	4.65
Mesabi nonbessemer, 51½%	4.50
High phosphorus, 51½%	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%	9.00 to 10.00
Copper-free low phos. 58-65%	nominal

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 10-12% manganese	11.00 to 11.50
North African low phosphorus	12.50
Swedish basic, 65%	9.50 to 10.50
Swedish low phosphorus	12.00
Spanish and North African basic, 50 to 6% (nominal)	11.50 to 12.00
Newfoundland foundry, 55%	9.00
Tungsten future, short ton unit, duty paid	15.25 to 15.50
Chrome ore, 48%, net ton c.if.	$22.50

MANGANESE ORE

Prices, not including duty, are cents per unit; cargo lots.

Caucasian (52-55 per cent)	30 to 32 cents
Indian (48-50 per cent)	29 to 31 cents
Brazilian (46-48 per cent)	28 cents

FLUORSPAR

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, import duty paid east, tide., gross ton	$19.50 to 20.50

REFRACTORIES

FIRE CLAY BRICK
Per 1000 f.o.b. works

First Quality

Pennsylvania	$43.00 to 46.00
Ohio	43.00 to 46.00
Illinois	43.00 to 46.00
Kentucky	43.00 to 46.00
Missouri	43.00 to 46.00
Maryland	43.00 to 46.00
Georgia and Alabama	40.00 to 45.00

Second Quality

Pennsylvania	35.00 to 38.00
Ohio	35.00 to 38.00
Illinois	35.00 to 38.00
Kentucky	35.00 to 38.00
Missouri	35.00 to 38.00
Maryland	35.00 to 38.00
Georgia and Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham	50.00 to 51.00

MAGNESITE BRICK
Per Net Ton

9 x 4½ x 2½	65.00

MAGNESITE
Net Ton Chester, Pa., and Baltimore base

Dead-burned grain magnesite	$40.00
Domes., Chewelah, Wash., base	22.00

CHROME BRICK
Net Ton Chester, Pa., and Baltimore base

9 x 4½ x 2½	$45.00

Pig Iron

Demand Steady, with Shipments Maintaining Good Lead Over January—Two Additional Stacks Lighted—Sales in Small Lots

DEMAND for pig iron shows greater tenacity than the general tone of the market indicates. Sales are in fairly heavy volume, though generally in small lots, while shipments maintain a substantial lead over those of the comparable period in January. Merchant furnaces in the Chicago district are 25 per cent ahead of last month in shipments, but report February as a whole will register a gain of only 15 per cent. Eighty-five to 90 per cent of their output for March has been covered. Cleveland furnace interests booked 20,000 tons in the past week, the same as in the week preceding. Sales in the St. Louis district totaled 15,000 tons. Five thousand tons of malleable is pending in the New England district. Two additional stacks, one a merchant unit, have resumed operations.

PITTSBURGH, Feb. 18.—Sales of pig iron hold to the recent slow rate while shipments are ahead of the comparable period in January. Most buyers are reluctant to order beyond early needs and current purchases are for 500 tons or less. Producers are gradually reducing stocks of some analyses as production still is restricted. Demand is not sufficient to warrant lighting additional stacks. Prices are unchanged, and as few inquiries are appearing sellers believe concessions would not develop much additional business. Consumption has improved moderately since the first of the year, although radiator and sanitary ware interests show considerably less expansion in operations than steelworks.

Boston, Feb. 18.—Purchase of 3000 tons of pig iron by General Fire Extinguisher Co., Providence, R. I., in the past week, served to increase the aggregate of sales to 6000 tons. Mystic Iron Works, Alabama and Buffalo furnaces received part of the Providence order. It was reported that the general price was around $20.50, delivered. The same company bought 200 tons of malleable. Prices are unchanged.

New York, Feb. 18.—Pig iron buying is restricted to small lots, the total for the week being about 6000 tons. Buffalo iron figures back to $16.50 to $17, base. Southern is easier at approximately $18.50, delivered New York docks. One seller bought 1700 tons of southern iron for shipment by barge to Jersey City. Thatcher Furnace Co., Garwood, N. J., is in the market for 1000 to 1500 tons. A Connecticut melter is inquiring for 200 tons of malleable. Demand for malleable is improving and in the New England district close to 5000 tons is reported pending. An important consideration in the recent purchase of 10,000 tons of foundry iron from a New England furnace by a Delaware river pipemaker was the fact the pipemaker at the same time sold 6000 tons of pipe to the gas company affiliated with the furnace.

American Locomotive Co., recently noted as having purchased 500 tons, has closed on 200 tons additional.

Buffalo, Feb. 18.—The Hanna Furnace Co. has placed another stack in production, its third in the district. This brings production back to ten units, with nine idle. Pending inquiry includes one 2000-ton lot for a New England melter and a 1000-ton lot for a New Jersey consumer. Daily orders are sufficient to absorb production. Prices are subject to keen competition in the East.

Youngstown, O., Feb. 18.—The blowing-in of its fourth blast furnace at Haselton by the Republic Iron & Steel Co. gives the company five active stacks in its northern division, now on a 100 per cent basis. Demand for bessemer iron has improved but basic is moving slowly. No. 2 foundry and basic continue $18.50, valley, and bessemer and malleable $19.

Cleveland, Feb. 18.—After several weeks of progressive decline in new pig iron business the downward tendency appears checked. Cleveland furnace interests booked 20,000 tons in the past week, practically the same amount as in the week preceding. Melters have not departed from their custom of buying close in, as regards tonnage and delivery. Small sales are the rule. Shipments continue ahead of the comparable rate in January. Cleveland furnaces are meeting sharper competition again in outside territory, and $18 to $18.50 are the current prices on such business, while for local delivery the price continues $19, base, furnace. The lake furnace price for northern Indiana and Michigan remains $19.50 to $20, base. The removal of headquarters of the Hanna Furnace Co. from Cleveland to Detroit, which will be effected soon, has revived reports of prospective enlargement of the company's capacity at Detroit but such a plan has not taken definite form. A large traffic in boat iron this summer is expected by some furnace interests.

Cincinnati, Feb. 18.—Pig iron sales in this district totaled 8225 tons in the past week, slightly higher than the preceding week. Buying was chiefly for early needs, excepting a 1000-ton lot of southern iron for an Indiana melter, covering first half. The foundry melt has improved.

Chicago, Feb. 18.—Occasional inquiries appear for pig iron for second quarter and some tonnage has been placed. February shipments are about 25 per cent ahead of those of the first half of January, but the gain for the entire month will be only about 15 per cent. It is estimated 85 to 90 per cent of merchant

(*Concluded on Page* 76)

Pig Iron Prices

Per Gross Ton

Bessemer, valley furnace	$19.00
Bessemer, del. Pittsburgh	20.76
Basic, valley furnace	18.50
Basic, Pitts., dist. fur.	19.00
*Basic, del., Pitts.	19.63 to 20.13
Basic, del., eastern Pa.	19.00 to 19.50
Basic, Buff. fur. for local del.	18.00
Malleable, valley furnace	19.00
Malleable, Pitts., dist. fur.	19.50
*Malleable, del. Pittsburgh	20.13 to 20.63
Malleable, Cleve. fur. for local del.	19.00
Malleable, Chicago furnace	20.00
Malleable, Buff. fur. for local del.	19.00
Malleable, del. eastern Pa.	20.76 to 22.40
Malleable, Granite City fur.	20.00
No. 1 foundry, Chicago furnace	20.50
No. 2X, Eastern del., Phila.	21.76
No. 1X, Buff. fur. for local del.	20.00
No. 2 foundry valley furnace	18.50
No. 2 fdy., Pitts. dist. fur.	19.00
*No. 2 foundry, del. Pittsburgh	19.63 to 20.13
No. 2 plain Buff. fur. for local del.	18.50
No. 2 foundry, Chicago furnace	20.00
No. 2 fdy., Cleve. fur. for local del.	19.00
No. 2 fdy., Granite City	20.00
No. 2 plain, del., Phila.	20.76
No. 2 plain, Virginia furnace	17.75
No. 2 plain, Buffalo, del. Boston	21.41 to 21.91
No. 2, Brooklyn, Buffalo all rail	21.41 to 21.91
No. 2, Newark, N. J., Buff. all rail	19.78 to 20.28
No. 2 Ala., Bir. base, local del.	15.00
No. 2 Tenn., Bir. base, local del.	15.00
No. 2 Tenn., del. Cincinnati	17.19 to 18.19
No. 2 Alabama del. Cincinnati	17.19 to 18.19
No. 2 Alabama, del. Cleveland	20.51 to 21.01
No. 2 Alabama, del., Chicago	19.51
No. 2 Alabama, del., St. Louis	18.42 to 18.92
No. 2 Ala., Phila., dock dely.	18.25 to 19.25
No. 2 Ala., Balt., dock dely.	18.00 to 19.00
No. 2 Ala., N. Y., dock dely.	18.50
No. 2 Ala., Boston, dock dely.	20.21
No. 2X, Brooklyn, Buffalo all rail	21.91 to 22.41
No. 2X, Newark, Buff. all rail	20.28 to 20.78
No. 2X, eastern, del. Phila.	21.26
No. 2X, fdy., Buff. fur. for loc. del.	19.00
No. 2X, Buffalo, del. Boston	21.41 to 21.91
No. 2X, Virginia furnace	18.25
Gray forge, Pitts. dist. fur.	18.50
*Gray forge, del. Pittsburgh	19.13 to 19.63
Low phos., standard, valley	27.00
Low phos., standard, Phila	24.76
Low phos., copper bearing fur.	23.00 to 24.00
Charcoal, Superior, del., Chicago	27.04

*Freight from Pittsburgh district furnace to points in Pittsburgh district 63.00c, 76.00c and $1.13 per ton.

CANADIAN PRICES

No. 1 foundry, del. Toronto	$22.60
No. 1 foundry, del. Montreal	24.00
No. 2 foundry, del. Toronto	22.10
No. 2 foundry, del. Montreal	23.50
Malleable, del. Toronto	22.60
Malleable, del. Montreal	24.00
Basic, del. Montreal	22.50

Silvery iron, Jackson county, O., furnace in per cents: 5—$22; 6—$22 to $23; 7—$23 to $24; 8—$24 to $25; 9—$25 to $26; 10—$27 to $28; 11—$29 to $30; 12—$31 to $32; 13—$33 to $34.

Bessemer ferrosilicon, Jackson county, O., furnaces, in per cents: 10—$30; 11—$32; 12—$34; 13—$36; 14—$38; 15—$41; 16—$43.50; 17—$46.50.

The Market Section

Coke

Foundry Fuel Shipments Increase Moderately in Some Districts—Furnace Grades Dull

DEMAND for foundry coke is increasing in some districts and heating fuel still is moving briskly. Connellsville sellers, however, have had to sacrifice a few shipments of the latter grade owing to fewer calls from dealers. The market for furnace coke is quiet, business being limited to shipments on contracts. In certain districts the market for the furnace grade is easier.

Pittsburgh, Feb. 18.—Activity in the beehive coke market shows no increase since last week. The outlook for furnace coke is dull with current buying limited to small lots for prompt shipment. The price continues $2.60, minimum. Heating coke is approaching the end of an active season. Some distress offerings are noted at less than the general market of $2.10 to $2.15 for first drawings. Foundry cullings command higher prices but are scarce. Prices of standard foundry coke are steady, with demand unchanged.

Production of coke in the Connellsville region for the week ended Feb. 8 was 34,830 tons, compared with 31,190 tons the preceding week and 63,800 tons in the same period a year ago, according to the *Connellsville Courier*.

Boston, Feb. 18.—Foundries continue cautious in buying coke. Demand for domestic grades is good. Prices are steady.

New York, Feb. 18.—Beehive furnace coke is slightly stronger although prices continue $2.50 to $2.75, Connellsville. Beehive foundry coke is unchanged at $3.50 to $3.75, Connellsville, and $4.85, Latrobe, with specifications more active. By-product foundry coke is $9 to $9.40, delivered Newark, N. J.; $11, delivered New England, and $9, Philadelphia.

Cincinnati, Feb. 18.—Shipments of by-product foundry coke are showing continued improvement compared with January, with some interests predicting a further upturn soon. Prices are unchanged.

Chicago, Feb. 18.—By-product foundry coke shipments are approximating those of January when deliveries exceeded those of January, 1929. The price is unchanged at $8, ovens, and $8.75, for local delivery. Oven capacity is almost fully engaged.

St. Louis, Feb. 18.—Ordering of metallurgical coke in this district is confined almost exclusively to immediate demands. Some purchasing for future requirements by users outside the district, principally in the West and Southwest, is reported. The leading east-side producer is operating close to capacity. Prices are unchanged.

Birmingham, Ala., Feb. 18.—Production and consumption of coke in this district have improved. By-product ovens are operating almost at capacity. Republic Iron & Steel Co., Gulf States Steel Co., and others have tentative plans for construction of additional ovens. Prices are steady.

Coke Prices

Prices Per Net Ton

Beehive Ovens	
Connellsville furnace	$2.60
Connellsville foundry	3.50 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25
By-Product Foundry	
Newark, N. J., del.	$9.00 to 9.40
Chicago ovens	8.00
New England del.	11.00
St. Louis del.	9.00
Birmingham, ovens	5.00
Indianapolis del.	8.25
Ashland, Ky., ov., Connell. basis	6.50
Portsmouth, O., ov., Connell. basis	6.50
Buffalo ovens	8.75
Detroit ovens	9.00
Philadelphia, del.	9.00

Ferroalloys

Market Is Steady—Specifications for Ferromanganese Increase

New York, Feb. 18.—Following the recent reduction of $1 a ton on carload lots of ferromanganese, with differentials applying to larger quantities, the market has remained steady at $99, duty paid, tidewater. Specifications continue to increase. Spiegeleisen, 19 to 21 per cent, is $34, furnace, subject to differentials on quantities.

Specifications for special ferroalloys are running to good size. Chrome business is especially good. The tungsten market is unchanged. Not much business has been done lately but the outlook for future ore supplies is uncertain.

Pittsburgh, Feb. 18.—Specifications for ferroalloys are in good volume. Consumers of ferromanganese and spiegeleisen are maintaining little stock and shipments follow closely the variation in operating rates. Spot ferromanganese continues $103.79 to buyers of 500 tons and less, with relatively little activity noted outside specifications against contracts. Spiegeleisen is $34 on lots up to 100 tons. Ferrotungsten continues slow. The price is steady at $1.45 a pound for small lots. Shipments of ferrosilicon and ferrochrome are fairly active.

Bolts, Nuts, Rivets

Specifications Unchanged at About Rate of Last Year

NUT AND BOLT PRICES, PAGE 72

Pittsburgh, Feb. 18.—Little change is noted in specifications for bolts, nuts and rivets but activity compares favorably with that of a year ago, due partly to sustained purchases by railroads and structural fabricators. Jobbers are buying less than a month ago, when stocks were being replenished. The market continues 60 to 70 off for bolts and nuts and 3.10c, Pittsburgh, for large rivets.

New York, Feb. 18.—Bolt and rivet demand is featured by improved buying by structural fabricators. Otherwise trading is slack, with little demand from the jobbing trade. General contract on a government job near Wilmington, Del., has been awarded and the placing of approximately 100 tons of bolts, nuts and tie rods is expected shortly. Meanwhile, bolt and nut prices are unchanged at 60 to 70 off and rivet prices at 3.10c, Pittsburgh. Operations are slightly better, now averaging 50 to 60 per cent of capacity production.

Cleveland, Feb. 18.—Orders for nuts, bolts and rivets are fairly steady, in small quantities. Larger buyers have covered current needs. Operations are about 65 per cent.

Chicago, Feb. 18.—February specifications for nuts and bolts are slightly under last month and a year ago. Implement works are submitting lighter specifications this month, due largely to heavy orders taken out in January. Much of the car shop requirements also were ordered in December and January, and specifications from that source of demand likewise are lighter. Prices are unchanged with bolts and nuts at 60 to 70 off.

Ferroalloy Prices

(In dollars, except Ferrochrome)

*Ferromanganese, 78 to 82 per cent tidewater, duty paid	$99.00
*Ferromanganese del. Pittsburgh	103.79
Spiegeleisen, 19 to 21 per cent, domestic furnace spot†	34.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do., less carload	88.50
Do., 75 per cent	13.00 to 15.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.00
Do., for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.45
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producer's plant, net ton	160.00
Do., one ton to carload	170.00
Ferrophosphorus, per ton, carload 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

†Carloads. Differentials apply to large quantities.

*These prices contract, spot $5 higher.

Scrap

Upward Tendency Gives Some Higher Quotations—Small Supplies Strengthen Situation

SLIGHTLY higher prices rule in most centers of scrap activity. Mill requirements are larger and tonnages from consumers have not yet come into the market. Yard supplies generally are light and scrap producers are asking more than current quotations. Dealers are not willing to sell short at present.

Chicago, Feb. 18.—Heavy melting steel is up 25 cents to $13.50 to $14, a moderate purchase having been made by a steelworks consumer at the latter figure. A fairly strong speculative interest still exists and brokers have been buying melting steel grades at a top of $14. On the other hand, consumer interests have been exercising a downward pressure and this resistance has created some uncertain factors. As a result, most sellers are booking consumer tonnage cautiously. Dealers' yards are bare of prepared stocks and industrial scrap is slow in coming out. Plate scrap supplies are low, due in part to the fact that little tonnage has made its appearance from car shops. A western car and railroad supply maker again has shipped plate scrap into the Pittsburgh district. Increasing steelworks operations offer encouragement for consumption in the next 30 days.

New York, Feb. 18.—Dealers' buying prices have been advanced on skeleton steel and stove plate for mill consumption. This is based on a recent purchase by a Harrisburg, Pa., consumer, against which dealers are covering at $12, delivered. Stove plate

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	10.50 to 13.00
Boston, dealers	10.50 to 11.00
Boston, No. 2	10.50 to 11.00
Buffalo, No. 1	14.00 to 15.50
Buffalo, No. 2	12.50 to 12.75
Chicago	13.50 to 14.00
Cincinnati, deal	12.75 to 13.25
Cleveland, No. 1	14.00 to 14.50
Cleveland, No. 2	13.25 to 13.75
Detroit, No. 1 deal.	12.00 to 12.25
Detroit, No. 2 deal.	10.50 to 11.00
East Pa., del. mill	14.50
N. Y. deal R. R.	11.50 to 11.85
N. Y., deal. yd.	8.00 to 8.50
Pittsburgh, No. 1	16.75 to 17.25
St. Louis, No. 1	13.25 to 13.75
Valleys, No. 1	16.50 to 17.00

COMPRESSED SHEETS

Buffalo (dealers)	12.50 to 12.75
Chicago	11.75 to 12.25
Cleveland	13.00 to 13.50
Detroit, dealers	11.75 to 12.25
E. Pa. new mat	13.00 to 13.50
Pittsburgh	16.50
Valleys	15.50 to 16.00

BUNDLED SHEETS

Buffalo	9.50 to 10.00
Cincinnati, deal	10.25 to 10.75
Cleveland	10.75 to 11.25
Eastern Pa.	11.50 to 12.00
Pittsburgh	14.50 to 15.00
St. Louis	9.00 to 9.50

SHEET CLIPPINGS LOOSE

Chicago	7.50 to 8.00
Cincinnati	8.00 to 8.50
Detroit, dealers	9.00 to 9.50
St. Louis	9.00 to 9.50

STEEL RAILS, SHORT

Birmingham	13.00 to 14.00
Boston, dealers	9.25 to 10.50
Buffalo	18.25 to 18.75
Chicago (3 feet)	16.50 to 17.00
Chicago, 2 ft and under	18.00 to 18.50
Cincinnati, deal	17.75 to 18.25
Detroit, dealers	16.00 to 16.50
Pittsburgh (3 ft.)	19.00 to 19.50
Pittsburgh, 2 feet and under	20.00 to 20.50
St. Louis	17.50 to 18.00

STOVE PLATE

Birmingham	11.00 to 12.00
Boston consumers	10.50 to 11.00
Buffalo	12.50 to 12.75
Chicago, net	10.75 to 11.25
Cinn., deal., net	8.75 to 9.25
Detroit, net, deal	9.00 to 9.50
Eastern Pa.	11.50 to 12.00
N. Y., deal., mill	7.75 to 8.25
St. Louis	11.50 to 12.00

COUPLERS, SPRINGS

Buffalo	18.25 to 18.75
Chicago	16.00 to 16.50
Eastern Pa.	19.50 to 20.00
Pittsburgh	20.75 to 21.25
St. Louis	14.50 to 15.00

ANGLE BARS—STEEL

Chicago	16.00 to 16.50
St. Louis	13.50 to 14.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	18.50 to 19.00
Cleve. billet and bloom crops	17.50 to 18.00
Eastern Pa.	20.00 to 21.00
Pitts. billet and bloom crops	21.50 to 22.00
Pitts. sheet bar crops	21.00 to 21.50

FROGS, SWITCHES, GUARDS

Chicago	14.25 to 14.75
St. Louis	13.50 to 14.00

SHOVELING STEEL

Chicago	13.50 to 14.00
Cleveland	11.25 to 11.75
St. Louis	12.50 to 13.00

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	10.00 to 11.00
Boston, dealers	10.50 to 11.00
Buffalo, No. 1	11.50 to 12.00
Buffalo, No. 2	14.00 to 14.50
Chicago, No. 1	13.75 to 14.50
Chicago, No. 2	13.50 to 14.00
Cincinnati, No. 2	12.75 to 13.25
Eastern Pa.	15.00 to 15.50
N. Y., No. 1 deal.	12.00 to 12.50
Pittsburgh, No. 2	16.75 to 17.25
St. Louis, No. 1	12.25 to 12.75
St. Louis, No. 2	12.50 to 13.00

SPECIFICATION PIPE

Boston	9.00 to 9.50
Eastern Pa.	13.75 to 14.00
New York, deal	9.25 to 9.75

BUSHELING

Buffalo, No. 1	12.75 to 13.25
Chicago, No. 1	11.50 to 12.00
Cinn., No. 1 deal.	10.00 to 10.50
Cinn., No. 2	6.50 to 7.00
Cleveland, No. 2	10.00 to 10.50
Detroit, No. 1 new deal.	11.00 to 11.50
St. Louis, No. 1	9.50 to 10.00
Valleys, new No. 1	15.00 to 15.50

MACHINE SHOP TURNINGS

Birmingham	6.00 to 7.00
Boston, dealers	6.50 to 7.00
Buffalo	9.25 to 9.75
Chicago	7.50 to 8.00
Cincinnati, deal	8.00 to 8.50
Cleveland	10.25 to 10.75
Detroit	7.75 to 8.00
Eastern Pa.	11.00
New York, deal	7.00 to 7.50
Pittsburgh	11.50 to 12.00
St. Louis	6.75 to 7.25
Valleys	11.25 to 11.75

MIXED BORINGS, TURNINGS
For blast furnace use

Boston, dealers	5.50 to 6.00
Buffalo	11.25 to 11.75
Cincinnati, deal	9.00 to 9.50
Cleveland	10.50 to 11.00
Detroit, dealers	9.00 to 9.25
Eastern Pa.	11.00
New York, deal	7.00 to 7.50
Pittsburgh	11.75 to 12.50

CAST IRON BORINGS

Birmingham, chem.	13.00 to 13.50
Birmingham, plain	6.00 to 7.00
Boston, chem.	8.50 to 9.00
Boston, dealers	6.00 to 6.50
Buffalo	11.25 to 11.75
Chicago	9.50 to 10.00
Cincinnati, deal	9.00 to 9.50
Cleveland	10.50 to 11.00
Detroit, dealers	9.00 to 9.25
Eastern Pa.	11.25
Eastern Pa., chem.	14.50
New York, deal	7.00 to 7.50
Pittsburgh	12.00 to 12.50
St. Louis	9.50 to 9.75

PIPE AND FLUES

Cincinnati, deal	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	11.00 to 11.50
Chicago, net	11.75 to 12.25
Cincinnati	9.50 to 10.00
Eastern Pa.	11.50 to 12.00
New York, deal	7.75 to 8.25
St. Louis	11.50 to 12.00

FORGE FLASHINGS

Boston, dealers	9.00 to 9.25
Buffalo	12.50 to 12.75
Cleve. over 10 in.	11.50 to 12.00
Detroit	11.00 to 11.50

FORGE SCRAP

Boston, dealers	8.50 to 9.00
Chicago	17.50 to 18.00
Eastern Pa.	13.50 to 14.00

ARCH BARS AND TRANSOMS

Chicago, net	17.25 to 17.75
St. Louis	21.00 to 21.50

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	13.50 to 14.00
Chicago steelworks	10.50 to 11.00
Cleveland	12.00 to 12.50
Eastern Pa.	13.50
Pittsburgh	14.50 to 15.00
St. Louis	10.00 to 10.50

STEEL CAR AXLES

Birmingham	17.00 to 17.50
Boston, ship point	16.50 to 17.00
Buffalo	17.50 to 18.00
Chicago	18.20 to 18.75
Eastern Pa.	20.00 to 21.00
Pittsburgh	20.50 to 21.00
St. Louis	19.50 to 20.00

SHAFTING

Boston, ship point	14.50 to 15.00
Chicago	16.50 to 17.10
Eastern Pa.	19.00
New York, deal.	14.00 to 14.50
St. Louis	18.00 to 18.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	11.00 to 12.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.25 to 13.75
Buffalo, steel	18.00 to 18.50
Chicago, iron	14.00 to 14.50
Chi., rolled steel	17.00 to 17.50
Cincinnati	12.00 to 12.50
N. Y., iron, deal	10.50 to 11.00
Pittsburgh, iron	15.00 to 15.50
Pittsburgh, steel	20.75 to 21.50
St. Louis, iron	14.25 to 14.75
St. Louis, steel	15.75 to 16.25

NO. 1 CAST SCRAP

Birmingham, cup	12.00 to 13.00
Buffalo	14.50 to 15.00
Boston, textile	13.00 to 14.00
Chicago, mach.	15.10 to 15.70
Chicago, railroad	14.30 to 14.85
Chicago, agri.	13.15 to 13.70
Cincinnati, mach. cupolas, gross	18.25 to 18.75
Cleveland, cupola	15.00 to 15.50
Detroit, net, deal	11.25 to 11.75
East Pa. cupola	15.50 to 16.00
N. Y. cup. deal	10.85
N. Y., del. local foundries	15.00
Pittsburgh, cupola	14.50 to 15.00
San Fran., del.	13.50 to 14.00
Seattle	14.50 to 14.75
St. L. No. 1 mach.	14.50 to 15.00
St. Louis, No. 1	13.50 to 14.00

HEAVY CAST

Boston	10.50 to 11.00
Buffalo, breakable	10.50 to 11.00
Cleve., breakable	11.50 to 12.00
Detroit, auto, net dealers	12.00 to 13.00
Detroit, break. deal	9.50
Eastern Pa.	14.00
New York, deal	9.75 to 10.50
Pittsburgh	12.00 to 13.00

MALLEABLE

Boston, railroad	17.00 to 17.50
Buffalo	17.00 to 17.50
Chicago, agri.	13.75 to 14.25
Chicago, railroad	16.50 to 17.00
Cinn., R. R. deal	15.25 to 15.75
Cinn., agri., deal	14.25 to 14.75
Cleveland, rail	17.50 to 18.00
Detroit auto deal	14.50 to 15.00
St. Louis, rail	14.75 to 15.25

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	13.00 to 14.00
Boston	10.50 to 10.75
Buffalo	14.00 to 14.50
Chicago	14.75 to 15.25
Eastern Pa.	15.00
New York	10.50 to 11.00
St. Louis	14.00 to 14.50

LOCOMOTIVE TIRES

Chicago, cut	18.00 to 18.50
St. Louis, No. 1	14.50 to 15.00

LOW PHOS. PUNCHINGS

Chicago	16.00 to 16.50
Pittsburgh	18.50 to 19.50

may now be quoted at $7.75 to $8.25, New York, and skeleton steel at $7.75, New York. Buying of both No. 1 and No. 2 steel for Pittsburgh is reported but prices have shown no changes. A Pencoyd, Pa., consumer has held up shipments on automobile steel.

Boston, Feb. 18.—There has been a decided betterment in shipment of scrap to the Pittsburgh district in the past week, which has made the whole situation appar stronger. Dealers are finding it difficult to buy materials. A Worcester, Mass., mill is buying bundled skeleton, at $11.50, delivered.

Philadelphia, Feb. 18.—Specification pipe is easier, otherwise the scrap market is unchanged. Consumers are taking shipments more freely and embargoes are practically at an end.

Pittsburgh, Feb. 18.—Scrap is quiet, although fairly steady. Some mills are out of the market and buying by others is generally confined to small lots. Although such orders are fairly frequent, the demand for heavy melting steel is insufficient to provide a definite indication price trend. The average price is unchanged. Good quality steel continues to bring better than $17, and the market is quotable at $16.75 to $17.25. Railroad specialties are stronger with demand active.

Buffalo, Feb. 18.—Two sales of heavy melting steel are reported. One of probably 5000 tons was made to a consumer of selected material at $15.50, an advance of $1 a ton over his last purchase. Bethlehem is reported to have bought recently at $14 for No. 1 but this is said to have been a distress tonnage. No additional tonnage is available at this price, dealers claim.

Cleveland, Feb. 18.—Iron and steel scrap prices are holding at the levels of last week. General activity is slight. Movement to the Valley district has slackened following the impetus of last week. Brokers report booking a few odd lots but none of sufficient size to act as a strengthening factor. Some steel is being purchased by brokers at $14.50 for shipment on the sale made a week ago. No. 1 steel for a second consumer brings $14. No. 2 brings $13.50.

Cincinnati, Feb. 18.—Closing of railroad lists recently developed higher prices in some grades of iron and steel scrap with heavy melting steel advanced another 25 cents to $12.75 to $13.25.

St. Louis, Feb. 18.—Iron and steel scrap is firmer, with demand better than since last fall. Mills are buying some material, and would take considerably more if holders were willing to deal on the basis of present quotations.

While the trend is upward, actual advances were confined to a few items. Among these were steel car axles, which are in good demand and scarce; iron car wheels, No. 1 heavy melting steel, malleable of all descriptions and steel wheels and springs.

Toronto, Ont., Feb. 18.—With better conditions in the iron and steel industry a stronger demand has recently sprung up for scrap. Mills are taking supplies against contract and also buying for spot needs. Principal demand continues to center on iron grades and inquiries in this connection are increasing.

Birmingham, Ala., Feb. 18.—Better feeling is noted in iron and steel scrap and some tonnage is moving. Quotations remain firm. Heavy melting steel still is quoted at $10.50 to $13 and even $13.50.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$19.00
Steel axles	17.00
Car wheels	14.50
Stove plate	12.00
Wrought pipe	6.00
Turnings	6.50
Heavy melting steel	8.00

TORONTO

Steel axles	14.00
Iron axles	16.00
Heavy melting steel	9.00
Turnings	7.00
No. 1 mach. cast (net)	15.00
Malleable (net)	11.50

Semifinished Steel

Consumers Pressing for Still Lower Prices—Shipments Improve

SEMIFINISHED STEEL PRICES, PAGE 72

Pittsburgh, Feb. 18.—Specifications against semifinished steel contracts are heavier than a month ago, but consumers are taking material only in small lots as needed and producers have little forward business on their books. New buying remains light, with only occasional inquiries being received, practically all of which are confined to small tonnages. Producers continue to quote $33 for 4 x 4-inch rerolling billets, slabs and sheet bars despite continued pressure by users for lower prices. Wire rods are held at $40, though occasional reports are heard of concessions in the eastern market. Specifications for skelp have improved only slightly since the first of the year, with activity light in new buying. The price is 1.85c, Pittsburgh.

Philadelphia, Feb. 18.—Billet prices have been reduced $1 a ton here to conform with the middle western market. Rerollers now are $33, base, Pittsburgh, and forging $38.

Youngstown, O., Feb. 18.—Valley open-hearths are operating at 80 per cent. Sheet bars, slabs and billets are being shipped steadily by producers to nonintegrated mills in the district. The price of all three grades continues $33, Pittsburgh and Youngstown.

Cleveland, Feb. 18.—Specifications for sheet bars, billets and slabs are active but unfilled tonnage on books of the leading merchant interest is not as large as a week ago. Brisk demand, however, enables this interest to operate 13 of its 14 open hearths, practical capacity. Prices continue $33 for sheet bars, billets and slabs, Cleveland and Youngstown.

Chicago, Feb. 18.—Semifinished shipments are extended three to four weeks. Buyers in the open market are being forced to await their turn in deliveries. Shipments are proceeding at a rate much improved over January. Semifinished prices are nominal at $35, base Chicago, for billets and sheet bars. Wire rods are $41, Chicago.

Pig Iron

(*Concluded from Page 73*)

production for the district for March is sold. Sales now are slightly lower. A Wisconsin implement maker is inquiring for 1500 tons of foundry iron. South iron sellers are active. The northern pig iron price is unchanged at $20, base, furnace.

St. Louis, Feb. 18.—Reports reflect further increase in the melt of pig iron. Operations at steel mills are close to the rate prevailing just prior to the decline last fall. Release of orders by the automotive industry has stepped up activities at malleable shops and some jobbing foundries. Sales of pig iron in the past week totaled 15,000 tons A firmer tone has developed.

Birmingham, Ala., Feb. 18.—Pig iron sales continue about equal to production for most companies, and a little better for others. Surplus stocks are being reduced. Larger melters in the local territory are buying for two to four weeks. The price here is $15, base, with lower prices for shipment out side. Sale of a round tonnage for delivery outside is reported but makers deny accepting portions of the business, the price offered being too low. Considerable southern iron has been sold recently for delivery to eastern districts.

Toronto, Ont., Feb. 18.—Pig iron prices have been reduced $1 per ton in the Toronto and Montreal markets. Melters are placing larger spot orders. Future buying is practically at a standstill. The daily melt is holding at about 80 per cent.

Philadelphia, Feb. 18.—Demand for pig iron has increased moderately. Rundle Mfg. Co. has ordered 2000 tons of eastern Pennsylvania and southern foundry iron for its new plant at Camden, N. J. Eastern Pennsylvania foundry iron continues $20, base, furnace, with occasional concessions to meet outside competition. Two consumers are negotiating for basic iron. General Steel Castings Corp. is inquiring for 1000 tons of low phosphorus iron. One eastern Pennsylvania merchant stack is expected to go out of blast in the near future.

W-K-M Company, Houston, Tex., has increased its working capital by approximately $300,000 to provide for expansion of its manufacturing and distributing facilities. L. O. Koen is vice president and general manager.

Bars

Steady Demand Continues as Consumers Increase Operations—Demand Is Well Diversified

PRODUCERS of soft steel bars have been able to increase operations somewhat as larger consuming demand from many lines has appeared. February is holding well to the rate established in January and in some instances is increasing. Buying for future needs is still absent but fairly prompt delivery militates against need for covering far ahead.

BAR PRICES, PAGE 71

Chicago, Feb. 18.—Finishing mill operations have leveled to the rate established early this month, and it is indicated schedules will be increased next month. Forging plants, automotive parts makers, industrial and road machinery builders, tractor and implement works and car shops are leading consumers of bar mill products. Reinforcing bar fabricators indicate they expect to order out more material shortly for road programs and general building. Specifications and sales maintain a steady average. Bar mills are operating at 85 to 90 per cent, with alloy bar mills at about 50 per cent. The price of 1.95c, Chicago, is steady.

New York, Feb. 18.—Steel bars appear firm at 1.85c to 1.90c, Pittsburgh, with buying showing further improvement. Deliveries are from two to three weeks.

Philadelphia, Feb. 18.—Steel bar sales are sustained at the January rate. The price is 1.85c to 1.90c, base, Pittsburgh, subject to differentials on attractive business.

Pittsburgh, Feb. 18.—Steel bar demand is holding well at the rate of the past few weeks and despite the shorter month, February tonnage is expected to compare favorably with that of January even though business recently has failed to show the improvement of the preceding month. Orders continue to involve limited tonnages, with consumers unwilling to purchase for any but current needs. Mills are in a position to give fairly prompt delivery, which serves to encourage this practice. Specifications from cold bar finishers hold at approximately the January rate. The market continues to show a steady tone at 1.85c, Pittsburgh, on most tonnage, with 1.90c finding only limited application. Except in the case of preferred customers, 1.80c is confined to the Detroit district.

Youngstown, O., Feb. 18.—More steel bar orders are coming in than in several months, spread over a variety of consumers. Makers have advanced operations to 75 per cent, applying as well to independents as to the Carnegie Steel Co.'s mills. The steel bar price range continues 1.85c to 1.90c, Pittsburgh.

Exposition Is Arranged

In connection with the annual convention of the American Oil Burner association, to be held April 7-12 at Hotel Stevens, Chicago, a trade exhibition has been arranged for the exhibit hall of the hotel. At present 68 manufacturers of burners and accessory equipment, together with numerous oil companies, have reserved space in the exhibition, marking the first exposition held by the association in which oil companies have been represented.

Transue & Williams Corp. Increases Capital

Alliance, O., Feb. 18.—Transue & Williams Steel Forging Corp. stockholders held their annual meeting today at which time they approved the increase in authorized common stock from 500,000 shares to 110,000 shares. Directors were re-elected. The Transue & Williams corporation was recently mentioned in a possible merger with the Pittsburgh Forging Corp., Pittsburgh.

Cast iron water pipes were first made and used at water works at Versailles, France, in 1685.

Plates

New Business Subsiding—Shipments on Contracts Fair—More Inquiries for Refinery Work

THE market for plates is sluggish, new business not being up to its recent average. Shipments on contracts are fair, though large tonnage demand is lacking. Inquiries for 10,000 tons of plates for southwestern oil refinery work were added during the week to the tonnage pending at Chicago, bringing the total to nearly 35,000 tons. Cleveland is taking bids on 4500 tons.

PLATE PRICES, PAGE 71

Chicago, Feb. 18.—Plate fabricators in this territory have received inquiries for about 10,000 tons of refinery work in several lots for the Southwest. This brings inquiry to 30,000 to 35,000 tons. Included is about 4000 tons for Empire Oil & Refining Co. in Oklahoma, and at East Chicago, Ind., where another refinery unit is to be started this year, requiring about 2000 tons of plates. Car shop specifications are in steady volume. Prices are unchanged at 1.95c to 2.00c, Chicago. Deliveries are two to six weeks. Shipments of sheared plates are promised in ten days to two weeks.

New York, Feb. 18.—Plate mills generally are quoting 1.90c to 1.95c, Coatesville. This range is being shaded. On a recent lot of 143,000 pounds of plates for the Brooklyn navy yard, an important jobbing house here quoted the equivalent of 1.825c, Coatesville, while one mill quoted 1.85c, Coatesville. Another mill quoted 1.90c and still another 1.95c. A heavy buyer here is Standard Oil Co. of New Jersey. The Shell interests also continue consistent buyers for various small projects throughout the country. Platemakers here are interested in the opening of bids, Feb. 21, on 4500 tons of 48 and 54-inch steel pipe for Cleveland. An order is reported placed for 200 tons of plates for a municipal ferry boat to be erected at the Tebo plant of the Todd Shipyard Co. Reconditioning of the steamship MEUNCHEN, which recently sank at her pier in the North river, should require a substantial tonnage of plates.

Pittsburgh, Feb. 18.—Plate mills are benefiting to a greater degree as the result of improved car awards. Backlogs of such business have been increased and operations of local builders are expanding. Miscellaneous plate consumers show little increase in their requirements, with tank and barge work continuing slow. Pending barge work is fairly large but awards still are light. Plates are fairly steady at 1.85c, Pittsburgh, on the bulk of tonnage.

Cleveland, Feb. 18.—Moderate buying continues in plates. Occasionally an outstanding tonnage is noted, such as that needed for the 120 locomotives recently specified. The product of a local plate plant will be used and the amount is understood to exceed 1500 tons for the 40 locomotives which will be built at Lima, O., and to exceed 2000 tons for the 80 awarded to the American Locomotive Co. Three-piece fire boxes will be used. Political changes in Cleveland have interfered with the award of 3000 to 5000-ton pipe line. Bids were rejected and new bids asked to admit makers of welded steel pipe. Plates for the cars awarder recently to a Columbus, O., builder by the Chesapeake & Ohio railroad

and allied roads will be rolled by a United States Steel Corp. mill. More plates have been sold at 1.80c, Pittsburgh. Preferential tonnage buyers are closing at 1.75c.

Philadelphia, Feb. 18.—Plate demand is well maintained with eastern mills operating at about 60 per cent. Railroads have placed some fair tonnages. Prices continue 1.90c to 1.95c, base, Coatesville. Concessions below the minimum are infrequent.

CONTRACTS PLACED

650 tons, four tug boats, Erie railroad, to Carnegie Steel Co., through Pusey & Jones Corp.
400 tons, Standard Oil Co., San Francisco, to unnamed interest.
350 tons, underground tanks for Shell Oil Co., San Francisco, to Western Pipe & Steel Co.
200 tons, municipal ferry boat, Todd Shipyard Co., New York, to unstated interest.

CONTRACTS PENDING

4500 tons, 48 and 54-inch steel pipe, Cleveland; bids open Feb. 21.
640 tons for Standard Oil Co., San Francisco. Bids being taken.

Shape Tonnage Is Off

Washington, Feb. 18.—Preliminary figures for the actual tonnage of fabricated structural steel shapes dropped in January from December, 1929, and were also lower than January a year ago. The percentage of new orders to capacity fell off also. Department of commerce figures follow:

		New orders		Shipments
1929	Actual tonnage	Per cent of capacity	Computed tonnage	Computed tonnage
Jan.	277,103	71	273,350	281,050
Feb.	a222,723	69	265,650	238,700
March	b296,343	93	358,050	277,200
April	b277,926	87	334,950	304,150
May	c284,319	89	342,650	311,850
June	d287,185	90	346,500	292,600
July	e291,125	91	350,350	304,150
Aug.	g300,929	95	365,750	342,650
Sept.	h210,952	82	315,700	315,700
Oct.	k281,739	90	346,500	358,050
Nov.	n184,417	59	227,150	288,750
Dec.	p256,382	84	323,400	273,550
Total (year)		83	3,850,000	3,588,400
1930				
Jan.*	196,368	68	261,800	

a—Reported by 236 firms with a capacity of 320,900 tons; b—235 firms and 320,500 tons; c—233 firms and 319,450 tons; d—232 firms and 318,950 tons; e—231 firms and 318,750 tons; g—228 firms and 317,400 tons; h—225 firms and 314,580 tons; k—222 firms and 314,005 tons; n—216 firms and 311,360 tons; p—195 firms and 303,595 tons.
*Preliminary.

Pays $1,008,465 Benefits

New York, Feb. 18.—Benefits totaling $1,008,465 were paid last year to sick and disabled employes and dependents of deceased employes of Bethlehem Steel Corp. and its subsidiaries, according to the fourth annual report of the company's relief plan.

Since its inauguration June 1, 1926, $3,215,069 has been paid out. At the

Pipe

Municipal Buying Better—Utilities Still Defer—Boston Places 2100 Tons—Steel Grades Active

MUNICIPAL buying is led by Boston's order for 2100 tons. Catskill, N. Y., wants 3500 tons and Glendale, Calif., 1545. Several smaller lots of cast pipe were let. Public utility work will expand with better weather. Steel pipe situation improves. Milwaukee maker was awarded a 49-mile line of 20-inch. A 4500-ton job is up at Cleveland, requiring 48-inch welded pipe.

PIPE PRICES, PAGE 72

Pittsburgh, Feb. 18.—Pending gas and oil line pipe work features the market for tubular products although awards still are deferred. Action may be taken on several large lines before spring. Columbia Gas & Electric Corp. plans a line from Kentucky and West Virginia gas fields to Baltimore, Washington and Richmond, Va. Other pending lines include the project from Texas to Chicago and a 500-mile line for South Plains Pipe Line Co. Sun Oil Co. seeks permission to lay a line from its Marcus Hook, Pa., refinery to Pittsburgh. The Empire companies of the Cities Service Co. placed 49 miles of 20-inch pipe with the A. O. Smith Corp. Standard pipe demand is slightly heavier than a month ago. Seamless material continues quiet in the oil country. Locomotive and boiler tubing are in slightly better demand. Pipe mill operations generally continue at 40 per cent.

Boston, Feb. 18.—Most cast pipe business is of a private nature but tonnages are good. The largest municipal letting in some time was Boston's 2100 tons, with 10 tons of castings. The award went to Warren Foundry & Pipe Co., despite the fact it was third lowest, possibly because it has done so much work for Boston in recent years. Prices continue to show firmness in all sizes. Business has a promising outlook.

New York, Feb. 18.—Cast iron pipe prices continue firm. The low bid on 215 tons of cement-lined pipe of various sizes up to 48-inches for Newark, N. J., was $40.60. Municipal buying in volume is slow to get underway. Catskill, N. Y. is to open bids March 3 on about 3500 tons. For a New Jersey reservoir 220 tons of 42-inch cast pipe will be required.

Youngstown, O., Feb. 18.—Despite the latest petroleum price cut in leading producing fields, aimed to reduce crude oil production, demand for oil country goods has revived. This leads local makers to step up wrought pipe production to around 60 per cent this week. Some gain also is reported in the bookings of building pipe as against previous weeks' dullness.

Cleveland, Feb. 18.—Revised bids close Feb. 21 on Cleveland's pipe line. This involves 4500 tons of 48-inch steel pipe, and 1200 tons of 24-inch cast iron pipe. The movement of standard full weight merchant pipe to jobbers has not received its spring impetus as yet. Mill stocks are heavy and jobbers have no particular incentive to build up reserves. Prices are firm.

Chicago, Feb. 18.—Private buying of cast pressure pipe leads municipal work. Public utility orders will be released with more favorable weather. Minneapolis opened bids yesterday on 400 tons. Appleton, Wis., closed bids on 10,000 feet. La Crosse, Wis., awarded 200 tons of 6 to 12-inch. Prices are reported steady on the basis of $37 to $38, base, Birmingham.

Birmingham, Ala., Feb. 18.—All pressure pipe shops are speeding up production though full capacity is not yet in sight. Output is greater than a year ago and the early spring make will be better than for a long time. Quotations are firm at $37 to $38 on 6-inch and over sizes. The west coast is furnishing quantity inquiries.

CONTRACTS PLACED

2100 tons, 4 to 24-inch for Boston, to Warren Foundry & Pipe Co., with 10 tons of special castings, 24 to 48 inches.
1500 tons 4 to 24-inch for Erie, Pa., to James B. Clow & Sons.
215 tons, cement-lined cast pipe up to 48-inch, for Newark, N. J., to Warren Foundry & Pipe Co.
200 tons, 6 to 12-inch pipe for La Crosse, Wis., to American Cast Iron Pipe Co.
100 tons, 2 to 8-inch pipe for Muscatine, Iowa, to McWane Cast Iron Pipe Co.
150 tons, 8-inch monocast for King county, Wash., airports, to American Cast Iron Pipe Co.

STEEL PIPE

Unstated tonnage, 49 miles of 20-inch electrically welded steel pipe, for Empire companies of Cities Service Co., to A. O. Smith Corp.

CONTRACTS PENDING

10,000 feet 6-inch pipe for Appleton, Wis.; bids Feb. 17.
3500 tons, 16-inch, for Catskill, N. Y.; bids March 3.
1200 tons 24-inch for Cleveland; bids close Feb. 21.
1545 tons, 6 to 20-inch class B, C and 250. Glendale, Calif.; bids Feb. 20.
400 tons, 24-inch pipe for Minneapolis; bids Feb. 17.
220 tons, 42-inch cast iron water pipe, balancing reservoir, Wanaque aqueduct, New Jersey; bids Feb. 25.
205 tons, 4 and 6-inch class B, improvement of Compton avenue, Compton, Calif.; bids Feb. 18.

STEEL PIPE

4500 tons, 48-inch for Cleveland; revised bids close Feb. 21.
206 tons, 10 and 16-inch class B, Alhambra, Calif.; bids Feb. 18.
115 tons, 54-inch steel pipe, balancing reservoir, Wanaque aqueduct, New Jersey; bids Feb. 25.
108 tons, 2 to 6-inch class 150, Tempe, Ariz.; bids Feb. 20.

Sheets

Market Irregular, with Improvement in Pittsburgh and Chicago Districts—Prices Are Steadier

SHEET specifications have increased in some districts and decreased in others. Pittsburgh district mills report substantial improvement in new business of a miscellaneous character and larger shipments to several motorcar interests. Operating rates have been raised to 70 per cent in the Pittsburgh district and 75 per cent in the Chicago area. Valley output is slower.

SHEET PRICES, PAGE 71

Pittsburgh, Feb 18.—Sheet business shows a more substantial improvement, with heavier orders coming from a diversified list of consumers. Automotive tonnage is larger although it fails to equal demand for the common grades. One interest reports the past week's business as the heaviest so far this year and in excess of any week since last August. Automotive business is restricted to several of the leading makers. Electrical equipment manufacturers, car builders and jobbers are increasing their sheet requirements. Practically all sheet orders are for rush shipment. Prices are gradually being established at levels prevailing for the past several weeks. The minimums generally are 2.65c for black sheets, 3.30c for galvanized, 2.25c for blue annealed and 3.90c for autobody. Occasional concessions are reported on autobody and other grades in certain districts. The recent improvement in business has served to raise operating rates to about 70 per cent.

New York, Feb. 18.—Sheet buying is moderately active. Operations at some eastern plants are near capacity. Galvanized sheets are 3.30c to 3.40c, Pittsburgh, the lower figure being the more representative. Black sheets generally are 2.65c, Pittsburgh. Blue annealed plates are steady at 2.10c, Pittsburgh, blue annealed at 2.25c.

Philadelphia, Feb. 18.—Some sheet mills report a decrease in bookings while others note an increase. Certain mills are operating full, and others at 50 to 60 per cent. Blue annealed sheets continue 2.10c to 2.25c, base, Pittsburgh, for heavy and light gages, respectively, subject to concessions on desirable tonnage. Wide hot strip is selling at the same price as blue annealed or $2 a ton less. Galvanized sheets continue 3.30c to 3.40c, base, Pittsburgh, subject to concessions. Black sheets are unchanged at 2.65c to 2.75c, for one pass cold rolled, although 2.65c is the usual figure. Pickled and annealed continue to bring around $2 a ton less than the cold rolled.

Youngstown, O., Feb. 18.—While some important independent sheet mills in this district are well booked for three or four weeks others are able to make quick shipments. Local mills are 64 per cent active this week against 66 per cent last week. A lull has developed in new business. Additional purchasing is expected within the next ten days, especially in view of the reluctance of makers to book business for delivery far ahead at present prices. Quotations on common black sheets seem to have settled to 2.65c to 2.75c, Pittsburgh. Autobody sheets bring 3.90c, galvanized 3.30c to 3.40c, and blue annealed No. 9 gage 2.10c to 2.20c, and No. 13 gage 2.25c to 2.30c.

Cleveland, Feb. 18.—All sheet producers need orders. The recent buying movement failed to sustain itself and now large tonnage specifications are a rarity. Automotive buying of full finished has been disappointing and purchases of metal furniture, electrical and vitreous enameling sheets as well as other specialties has been only fair. Producers failed to keep their 4.00c, Pittsburgh, price on metal furniture stock and now openly quote 3.90c. Nothing lower than 3.90c has been done on autobody; 2.55c to 2.65c, Pittsburgh, continue available on black; 3.30c is easy for galvanized, and blue annealed is not strong.

Cincinnati, Feb. 18.—Miscellaneous demands for sheets were maintained during the past week but a cut in specifications from automobile manufacturers was reported. Mill production schedules may be reduced soon.

Chicago, Feb. 18.—Steel sheet specifications are improving. Operations are at about 75 per cent for the district, as against 60 to 65 per cent a week ago. Much heavier tonnage of corrugated roofing, conductor pipe and other galvanized roofing products is expected from the Southwest shortly because of open weather in the market territories there. Blue annealed specifications are steady. Prices of black and galvanized sheets have not been strengthened perceptibly. Mill quotations for No. 24 black are 2.75c to 2.85c, while galvanized sheets are 3.40c to 3.50c. Blue annealed sheets are unchanged at 2.45c. mills, for No. 13, and 2.30c for No. 10 gage. Local delivery quotations are $1 a ton higher.

St. Louis, Feb. 18.—From some sources the demand for sheets makes a good showing, but generally the market lacks aggressiveness on the purchasing side. Intensive sales efforts have brought fair results, but specifications tend to lag, except for car builders, farm implement makers and some lesser industries. Prices are steady.

Tin Plate

Specifications Increasing—Shipments Same as Last Year

TIN PLATE PRICES, PAGE 72

Pittsburgh, Feb. 18.—Tin plate specifications show further improvement, with mills receiving additional orders for April shipment. Business continues to compare favorably with the volume of a year ago and shipments to date for leading producers are practically the same as during the corresponding 1929 period. Some of the smaller producers are operating at capacity, with the average for the district holding around 70 to 75 per cent. Little new business is appearing. The price is $5.25 per 100-pound base box, Pittsburgh.

Malleable Output Low

Washington, Feb. 18.—January production of malleable castings, according to preliminary department of commerce figures, reveals tonnage at a low for the past 13 months, although remaining at approximately the same level as the two previous months. Production, however, is noticeably lower than the same month a year ago. Following are monthly figures:

1929	Production net tons	Shipments net tons	Orders booked net tons	Per cent of capacity operated
Jan.	73,125	77,231	76,787	77.7
Feb.	73,875	71,093	77,976	77.1
March	83,365	81,063	86,744	87.7
April	83,765	80,999	80,808	87.8
May	81,704	80,534	76,927	83.8
June	72,282	72,378	65,247	75.0
July	70,625	69,665	61,401	73.5
Aug.	68,651	69,240	61,982	70.0
Sept.	59,589	63,049	52,957	62.0
Oct.	65,305	58,749	60,954	67.9
Nov.	46,448	46,587	40,163	47.7
Dec.*	45,083	46,328	42,789	46.3
Total (year)	823,799	815,916	784,736	71.3
1930				
Jan.**	44,080	44,218	43,180	56.2

*Revised.
**Preliminary.

To Increase Efficiency

Detroit, Feb. 18.—Plans being made for expansion of capacity of the Michigan Steel Corp., rolling autobody sheets, are based upon a rearrangement of present facilities rather than the addition of more mills. The corporation now has 16 roughing and 15 finishing mills. An increase of 30 per cent capacity is contemplated.

The oldest blast furnaces known were in Siegerland, Rhenish, Prussia, and in Westphalia in 1443. Laws existed at that time for the regulation of blast furnaces and forges.

Structural Shapes

Numerous Bridges Figure in Awards, Inquiries—11,000-Ton Office Building Let—Inquiry Rate Improves—Prices Firm

BRIDGE items occupy first place in the structural news of the week because of being more numerous. Office buildings dominate, however, because of size. An 11,000-ton project was let in New York where another one, 4500 tons, is pending. Included also in awards, which this week total around 34,000 tons, is a 5000-ton subway section in New York, with several miscellaneous jobs in the 1000 to 2000-ton range. A Y. M. C. A. building of that latter size was let in Chicago and a 1900-ton bank job was awarded in Boston. Highway and railroad bridges are more numerous, approaching the heavy 1929 record. Plain material specifications are remarkably well sustained with mills in most sections, light car shapes helping out in Chicago. Prices are steady.

STRUCTURAL SHAPE PRICES, PAGE 71

New York, Feb. 18.—Bridge and subway lettings are fairly heavy. An 11,000-ton office building was placed. Another to take 4500 tons is up. Pending bridge work holds up well. One in Westchester county will take 2000 tons. Apartment house building has slumped sharply, especially in speculative construction. New inquiry is light. Mills and fabricators are gradually reducing backlogs. Building contracts placed thus far this year in New York and North New Jersey are far below last year. Shape prices are nominally held at 2.045c, New York. This level on medium sized tonnages is fairly firm. Some shading is reported on larger contracts.

Boston, Feb. 18.—Awards last week aggregated more than 2500 tons, including a bank addition, 1900 tons. A 1500-ton railroad bridge is pending. Other awards include a 500-ton railroad bridge and a power house roof, 230 tons.

Philadelphia, Feb. 18.—Shape demand has improved. Eastern mills are now operating 80 to 85 per cent. The price situation continues easy with 1.80c, base, eastern mill, fairly common on plain standard shapes. The general range continues 1.80c to 1.90c with lower done on desirable tonnages.

Pittsburgh, Feb. 18.—Structural steel awards and inquiry are less active. Pending work is fair but new projects generally involve small tonnages. Recent awards, with a few exceptions, require less than 100 tons at a time. Specifications for plain material hold fairly well at the rate of recent weeks and operations of the larger fabricating shops continue seasonally high. Shapes generally are 1.85c, Pittsburgh.

Buffalo, Feb. 18.—Lackawanna Steel Construction Co. has started deliveries on 500 tons of structural steel for a new bridge at Tonawanda, N. Y. While contract was awarded in 1929, construction was deferred until the present. An inquiry for about 600 tons of steel for the new bridge over the Genesee river at Rochester, N. Y., is the largest now pending.

Cleveland, Feb. 18.—Several small jobs are up in this vicinity and Nickel Plate is asking bids on additional bridges, one at Angola, N. Y., about 800 tons and one here at East Ninety-third street, between 200 and 300 tons. Alterations to Sheriff street market and the East Liverpool, O., hospital, each take about 100 tons. Bids are going in on the Mayflower hotel, Akron, O., about 3000 tons. Several jobs are up at Toledo, O., including police headquarters, 800 tons; Toledo university building, 500 tons; plant, Libbey-Owens Glass Co., 200 tons; factory, Toledo Scale Co., 1400 tons; and a few smaller ones. The largest active job pending locally is the service building, Western Reserve university, 400 tons. The spring will see much work open up and it is authoritatively stated that at least two structures for the terminal group, the Cleveland hotel and the department store, taking more than 10,000 tons apiece, will go ahead during the first half. Plain material is 1.80c, base, Pittsburgh.

Chicago, Feb. 18.—Building work, while disappointing in the immediate Chicago territory, is more active in points outside. Fresh inquiry totals 4000 to 5000 tons. Specifications from the car shops for light shapes comprise the leading mill orders. A pick-up in tonnage from general manufacturing lines has developed. Highway and railroad bridge work is approaching the heavy volume of a year ago. Structural mill operations are about 75 per cent. Plain material prices are unchanged at 1.95c to 2.00c, Chicago.

CONTRACTS PLACED

11,000 tons, 35-story office building, Broadway, Thirty-eighth and Thirty-ninth streets, New York, to Harris Structural Steel Co., through Fred T. Ley Co., general contractors.

5000 tons, subway, route 110, section 3, New York, to Harris Structural Steel Co., through Carlton Construction Co.; sections to be rolled at Pencoyd works by American Bridge Co.

2000 tons, Victor Lawson Memorial Y. M. C. A., North Dearborn street, Chicago, to American Bridge Co.

1900 tons, addition, Atlantic National bank, Boston, to Palmer Steel Co.

1800 tons, factory buildings, Western Electric Co., Kearny, N. J., to McClintic-Marshall Co.

1600 tons, power plant at Bagnelle, Mo., to unstated fabricator.

1600 tons, bridge, Hackensack river, Secaucus, N. J., to Bethlehem Steel Co., through International Engineering Co.

900 tons, apartment, Second avenue and Twenty-first street, New York, to Harris Structural Steel Co.

800 tons, bridge, New York Central railroad, New Hamburg, N. Y., to Phoenix Bridge Co.

650 tons, Olney avenue bridge, Philadelphia, to Bethlehem Steel Co.; reported last week as 600 tons.

580 tons, bridge, Northampton, Fulton county, N. Y., Hudson river regulating district, to American Bridge Co., through Herman Snyder & Son, general contractors, Dolgeville, N. Y.

500 tons, Powelton avenue tunnel, Philadelphia, to American Bridge Co.

500 tons, bridge at West Claremont, N. H., for Boston & Maine railroad, to American Bridge Co.

450 tons, St. Benedict's church school, Bronx, N. Y., to Easton Structural Steel Co.

450 tons, grade separation work, Detroit, Grand Trunk railroad, to McClintic-Marshall Co.

450 tons, armory addition, One Hundred and Twenty-fourth Field Artillery, Chicago, to New City Iron Works.

400 tons, bridge work, Chicago, Burlington & Quincy railroad, Omaha, Nebr., to Vierling Steel Works.

400 tons, mill building, Wisconsin Steel Co., South Chicago, Ill., to Lakeside Bridge & Steel Co.

360 tons, building, Viscose Corp., Lewistown, Pa., to Belmont Iron Works.

300 tons, plant research laboratory, Boyce, Thompson Co., Yonkers, N. Y., to Montgomery Iron & Steel Co.

300 tons, four tugs, Erie railroad, to Carnegie Steel Co., through Pusey & Jones Corp.

300 tons, bridge, Pennsylvania railroad, Sunbury, Pa., to Phoenix Bridge Co.

265 tons, three buildings for Libby, McNeil & Libby in Hawaiian Islands to Honolulu Iron Works.

250 tons, garage for Kahalia railroad, Honolulu, to California Steel Co.

250 tons, building, Armour & Co., Kansas City, Mo., to Kansas City Structural Steel Co.

230 tons, power house roof, Bingham, Me., to Lyons Iron Works.

230 tons, school Tuckahoe, N. Y., to Just Structural Engineering Co.

225 tons, bridge at Indianapolis, Louisville & Nashville railroad, Cincinnati, to American Bridge Co.

180 tons, school addition, Clifton, N. J., to J. F. Schmidt Iron Works.

175 tons, building, Firestone Tire & Rubber Co., Pittsburgh, to Levinson Steel Co.

150 tons, state highway bridge, New York, to American Bridge Co.

150 tons, school, Fifth and Fitzwater streets, Philadelphia, to American Steel Engineering Co.

Awards Compared

	Tons
Awards this week	34,405
Awards last week	60,662
Awards two weeks ago	48,082
Awards this week in 1929	21,498
Average weekly awards, 1930	34,560
Average weekly awards, 1929	38,603
Average weekly awards, Jan.	26,666
Total awards to date, 1929	266,920
Total awards to date, 1930	276,479

135 tons, Alabama Union building, University of Alabama, University, Ala., to Nashville Bridge Co.

115 tons, bridge, Pennsylvania railroad, Harrisburg, Pa., to Phoenix Bridge Co.

110 tons, factory, West Coast Glass Co., Los Angeles, to McClintic-Marshall Co.

100 tons, factory, Nason Paint Co., San Francisco, to Western Iron Works.

100 tons or more, bridge superstructure over Grand Glaize creek, Zebra, Mo., to Stupp Bros. Bridge & Iron Co., through Sverdrup & Parcel Co., Railway Exchange building, St. Louis.

100 tons or more, First Presbyterian church, Corpus Christi, Tex., to Houston Structural Steel Co.

CONTRACTS PENDING

4500 tons, office building, Broadway and Thirty-ninth street, New York.

3000 tons, Mayflower hotel, Akron, O.; bids being filed.

2650 tons, bridge work in Texas for Texas & Pacific railroad, at Dallas, Tex.

2200 tons, addition to Morrison hotel, Chicago.

2000 tons, postoffice, Scranton, Pa.

2000 tons, bridge, Westchester County Park commission, New York.

1800 tons, Meier & Frank store, Portland, Oreg.; bids Feb. 20.

1500 tons, bridge at Goffs Falls, N. H., for Boston & Maine railroad.

1400 tons, building, Toledo Scale Co., Toledo, O.; bids in.

1400 tons, hospital at Presidio, San Francisco; bids Feb. 25.

1000 tons, factory buildings, RCA Victor Co., Camden, N. J.

800 tons, police headquarters, Toledo, O.; bids asked.

800 tons, bridge, Nickel Plate railroad, Angola, N. Y.; bids being asked.

750 tons, Lane hospital addition, San Francisco; bids called shortly.

600 tons, for Genesee river bridge, Rochester, N. Y.; bids in.

600 tons, unit, Toledo university, Toledo, O.; revised bids being considered.

600 tons, state highway bridges, North Carolina.

550 tons, mill, Oakdale Hosiery Co., Reading, Pa.

500 tons, addition, Pilgrim hospital, Long Island, N. Y.

500 tons, state school buildings, Wassaic, N. Y.

500 tons, General hospital, Philadelphia.

500 tons, New Mexico, state bridge work.

500 tons, state buildings, Manteno, Ill.

400 tons, building, Walker Vehicle Co., Chicago, in addition to recent inquiry.

400 tons, public school No. 138, Queens, N. Y.

400 tons, two schools, Mt. Vernon, N. Y.

200 tons, building, Libbey-Owens Glass Co., Toledo, O.; bids in.

200 to 300 tons, bridge, Nickel Plate railroad, East Ninety-third street, Cleveland; bids being asked.

200 tons, Sauk river bridge, Snohomish county, Wash.; bids Feb. 24.

175 tons, ferry slip, Greenpoint avenue, Brooklyn, N. Y.

100 tons, alterations, Sheriff street market, Cleveland; Republic Structural Iron Works low bidder.

100 tons, hospital, East Liverpool, O.; bids asked.

100 tons, infirmary, Lorain county home, Elyria, O.; bids March 15.

100 tons, waterworks plant, Killbuck, O.; general contract to Arnold, Rousch & Harline, New Philadelphia, O.

Unstated tonnage, mill, Busy Bee Hosiery Co., Reading, Pa.

The Liberty Bell was first cast in England in 1752. It cracked in ringing after arrival in America, and was recast in Philadelphia from the same metal and with the same inscription in 1753.

Concrete Bars

Prospects Brighten With Better Weather—Individual Jobs Grow—Prices Weak

LARGER jobs let and pending indicate concrete bars at last are hitting their stride. Activity is more pronounced as spring advances. Oklahoma bought 4500 tons, a New Jersey auto plant 1200, and a New York bank, 650. Rochester, N. Y., has a 1600-ton bridge up; Erie, Pa., a 600-ton filtration plant; Boston a 600-ton store. Middle west states contemplate much road building.

REINFORCING BAR PRICES, PAGE 71

New York, Feb. 18.—Concrete reinforcing bars hold at 2.44c, f.o.b. New York, for mill stocks, with 2.54c, delivered to the job, for carload lots. Competition is keen and buyers are slow to close. A fair volume of work has been figured. New work coming into the market is not heavy. National Bridge Co. was awarded 650 tons for a bank building. A New Jersey reservoir will take 485 tons and a Westchester county bridge calls for 300 tons. Warehouse volume has slumped slightly.

Boston, Feb. 18.—Recent developments in concrete bars have brought about a much better feeling among producers. Three or four large projects are near the award stage. A Sears, Roebuck & Co. store addition at Brighton will take 600 tons. One 175-ton bank job was placed.

Pittsburgh, Feb. 18.—Pending work in concrete reinforcing bars continues to expand but a hesitancy to close on several projects is noted. Business so far thi smonth is slightly below the tonnage for the corresponding January period but the volume remaining to be placed indicates heavier demand for the next few weeks. Prices are fairly steady at 1.95c for stock lengths and 2.20c for cut lengths, although some tonnage is going at $2 a ton less.

Buffalo, Feb. 18.—More than 3000 tons of reinforcing bar inquiry is pending here for early coverage. This includes 1600 tons for a Rochester bridge, 600 tons for two Buffalo schools, 500 to 600 tons for an Erie, Pa., filtration plant and several smaller lots. Road contractors are beginning to line up their mesh needs for spring construction. These promise to be large in this district.

Chicago, Feb. 18.—Reinforcing bar fabricators, expecting an impetus in building work the next 30 days, take more bar material from the mills. Small tonnage work being closed is fair. Larger awards are scarce. Billet reinforcing bars are more stabilized on the basis of 2.00c, Chicago, for lots over 30 tons. Road building programs are taking form. If the Illinois supreme court sustains the gasoline tax law, that state will have approximately $25,000,000 for road building this year. Indiana expects to lay 450 miles of hard surfaced highway, Minnesota 230, Iowa 1000; Wisconsin 337, and Missouri 457 miles, as a part of a $75,000,000 program.

Awards Compared

	Tons
Awards this week	8,750
Awards last week	5,513
Awards two weeks ago	4,114
Awards this week in 1929	4,283
Average weekly awards, 1929	5,849
Average weekly awards, 1930	4,417
Average weekly awards, Jan.	3,393
Total awards to date, 1929	51,813
Total awards to date, 1930	35,339

CONTRACTS PLACED

4500 tons, Oklahoma state requirements, including mesh, for 1930, to Sheffield Steel Corp.

1200 tons, assembly plant, Edgewater, N. J., for Ford Motor Co., Detroit, to Truscon Steel Co.

650 tons, City Bank-Farmers' Trust building, William street, New York, to National Bridge Co.

600 tons, Haynes avenue bridge, Newark, N. J., to Concrete Steel Co.

450 tons, sewer, Akron, O., to Concrete Steel Co.

400 tons, telephone building, Binghamton, N. Y., to Concrete Steel Co.

250 tons, school, Fifth and Fitzwater streets, Philadelphia, to American Steel Engineering Co.

200 tons, El Paisano hotel, Gateway Hotel Co., Marfa, Tex., to Southern States Steel Corp.

175 tons, partial requirements, Atlantic National bank building, Boston, to Republic Fire Proofing Co.

125 tons, Saddle river bridge, Fairlawn, N. J., to Igoe Bros.

100 tons, factory, Beckwith & Chandler, Newark, N. J., to Truscon Steel Co.

100 tons, Chandler garage, Chicago, to Inland Steel Co.

CONTRACTS PENDING

1000 tons, Hoyt street sewer, Philadelphia.

800 tons, (estimated) viaduct, Chicago, Rock Island & Pacific railroad, Joliet, Ill.

600 tons, store addition, Sears, Roebuck & Co., Brighton, Boston; bids Feb. 21.

500 tons, filtration plant, Erie, Pa.; bids soon.

485 tons, balancing reservoir, Wanaque aqueduct, New Jersey; bids Feb. 25.

400 tons, two reservoirs at Jacksonville and Springfield, Ill., 200 tons each.

300 ton, bridge, Westchester County Park commission, New York.

210 tons, (mesh), for Wales-Wales Center Highway, Erie county, N. Y.; Martin Wunderlich, St. Paul, low bidder.

200 tons, reservoir, Valparaiso, Ind.

200 tons, State road sewer, Philadelphia.

180 tons, for school No. 89, Buffalo; bids soon.

160 tons, (mesh), for Batavia-Leroy, N. Y., highway; Liberto & Cerullo Inc., Depew, N. Y., low bidder.

Unstated tonnage, New Madrid-Bird's Point floodway levee near Memphis, Tenn.; bids opened Feb. 4 by Lieut.-Col. F. B. Wilby, district engineer; Wilbanks & Pearce, Rosedale, Miss., low bidders on section 4-F; J. H. Boyce Sons & Roy L. Igoe, Memphis, low bidders on section 4-E. Both jobs involve about $1,000,000.

Operating Rates

Report Gain at Buffalo and Pittsburgh —Average of all Districts at 80

Cleveland—Open-hearth output still is high with operations continuing at 30 out of 34 furnaces for the district. The leading interest has 13 of 14 going, and specifications for semi-finished exhibit prospects of continuing good.

Buffalo—Open-hearth operations rose to 74 per cent at the beginning of this week, the highest production rate here in more than three months. It is predicted that schedules for the last half of this month will hold to this level.

Pittsburgh—Ingot output is slightly higher at better than 75 per cent, with some independent mills at an even higher rate. Sheet operations are higher at 70, with tin plate schedules unchanged at 70 to 75. Strip continues 55 to 65 and pipe output remains unchanged at 40.

Chicago—Ingot output is 88 to 90 per cent. Activity in the structural mills has been increased to 75, and plate and bar mills are at 85 to 90. Rail production continues at a capacity rate. Sheet operations have been increased to 75, as against 60 to 65 a week ago. Of the 36 steelworks blast furnaces, 26 are active.

Youngstown, O.—Steel production remained stationary at about 76 per cent, but iron output was increased. Pig iron is at about 60, as 19 of the 34 blast furnaces are active. Corporation steel production is reported at between 65 to 70. Pipe rose to 60 with the approach of the construction season and consequent greater demand. Strip is operating at 85, with the same rate for independent tin mills, while Corporation tin plate plants are at 75. Sheet production is unchanged at approximately 65. All bar mills are at 75.

Enamel Solubility Tests Reviewed in Booklet

The solubility of enamels is the subject of a new booklet issued by the engineering experiment station of the University of Illinois, Urbana, Ill., entitled "Acid Resisting Cover Enamels for Sheet Iron," by Andrew I. Andrews. This publication, known as bulletin No. 201, points out that among the factors influencing the resistance to acid are the chemical composition, smelting temperatures, conditions and time, fineness of grinding, and burning temperatures and times.

Rails, Cars

February Best Car Order Month Since October — Louisville & Nashville Buys 1800—Rails Fair

ALREADY February car lettings aggregate more than 16,400, representing a larger car order month than any since last October. Louisville & Nashville distributed 1800; Canadian Pacific, more than 600 units. Seaboard Airline bought 3000 tons of rails. Miscellaneous rail tonnages placed in Chicago district involve 12,500 tons; accessories, 12,000 tons.

RAILROAD TRACK PRICES, PAGE 72

New York, Feb. 18.—Closing of 1800 freight cars by the Louisville & Nashville, along with other miscellaneous buying, brings the total number of domestic freight cars placed so far this month up to more than 16,400. This figure already is in excess of any monthly total since last October. Inquiry involves a relatively small aggregate, although lists are fairly numerous. Locomotive buying has slackened.

About 275 coaches now are pending. This is the largest list since last October when 300 New York subway cars were awarded. Following recent heavy freight car buying, pending active inquiries now total around 4000; the smallest car list pending in many weeks.

Pittsburgh, Feb. 18.—Of Louisville & Nashville's 1800-car order, 1050 were placed in this district. It is understood here that the Van Sweringen lines will place no additional equipment at this time despite reports that further orders were contemplated. Local car builders have favorable backlogs. At least one plant plans to increase operations shortly. Specifications for track fastenings are fairly steady although releases against some orders are being held up. Light rails continue quiet with the price suffering in instances by reason of competition with sellers of rerolling rails. The market generally is $36.

Cleveland, Feb. 18.—Wheeling & Lake Erie placed 1000 tons of rails for immediate delivery.

Of the 90,800 wheels required for the 11,350 cars purchased recently by Cheasapeake & Ohio, Pere Marquette and Hocking Valley railroads, it is reported that 64,000 will be cast iron and the remainder wrought steel.

Chicago, Feb. 18.—Several miscellaneous rail tonnage orders during the week amounted to 12,500 tons. Track accessory sales total about 12,000 tons. Track fastenings purchases, except for quarterly releases, are practically finished for this year.

CAR ORDERS PLACED

Anglo-Chilean Consolidated Nitrate Corp., 20 25-ton box cars to Magor Car Corp.

Bangor & Aroostook, 12 underframes for passenger cars, to Osgood-Bradley Car Co.

Calumet & Hecla Consolidated Copper Co., four 20-yard air dump cars, to Koppel Industrial Car & Equipment Co.

Canadian Pacific, 500 freight cars and miscellaneous passenger equipment as follows: 250 75-ton coal cars, 50 sleepers, three mail cars, five compartment car frames, two overnight sleeping car frames, and 14 parlor car frames, to Canadian Car & Foundry Co.; 250 refrigerator cars, 10 baggage cars, eight dining car frames, 13 first-class passenger car frames, and seven smoke car frames, to National Steel Car Co.

Chicago, Rock Island & Pacific, 50 caboose cars, to own shops; also four steel parlor cars and ten steel coaches, to Pullman Car & Mfg. Corp.

Missouri Pacific, 20 cabooses, to St. Louis Car Co.

General Chemical Co., 15 70-ton tank cars, to American Car & Foundry Co.

Great Northern, one 75-foot baggage and mail gas-electric rail motor car, to J. G. Brill Co.

Louisville & Nashville, 1800 cars, including 500 gondolas, 300 hopper and 250 flat, all 50-ton capacity, to Pressed Steel Car Co.; 500 50-ton box to Mt. Vernon Car Mfg. Co.; 250 70-ton gondolas to Pullman Car & Mfg. Corp.

Pere Marquette, 25 caboose cars, to Magor Car Corp.

Wagner Quarries Co., two 30-yard dump cars, to Koppel Industrial Car & Equipment Co.

RAIL ORDERS PLACED

Seaboard Air Line, 3000 tons 100-pound rail, to Tennessee Coal, Iron & Railroad Co.

South Manchurian railway, 150 tons, 100-pound sections, to Manganese Steel Rail Co., through Mitsui & Co., New York.

Wheeling & Lake Erie, 1000 tons, to Carnegie Steel Co.

CAR ORDERS PENDING

Central Railroad of New Jersey, 25 passenger coaches.

Inland Lime & Stone Co., 25 to 30 50-ton gondolas.

Louisville & Nashville, 23 passenger coaches.

New York, New Haven & Hartford, 11 coach underframes.

Reading, 70 passenger coaches.

Rock Island Refining Co., 150 8000-ton and 50 10,000-gallon tank cars.

Union Carbide Co., four steel flat bottom 50-ton gondolas.

Youngstown Sheet & Tube Co., 80 gondola bodies.

LOCOMOTIVE ORDERS PENDING

Michigan Lime, Stone & Chemical Co., two 6-wheel switching locomotives.

Northern Alberta, two 2-10-0 type locomotives.

RAIL ORDERS PENDING

Board of Transportation, New York, 2000 tons, 100-pound rail, for four subway sections; also bolts, washers, nuts, spikes, tie plates, malleable iron, cast iron and joint bars; bids open Feb. 25, Borough of Manhattan, New York.

The Engineering Societies of Boston have commenced publication of a journal to appear monthly except July and August. Vol. 1 No. 1 is dated February, 1930. Editorial contents will include general engineering articles and news of affiliated organizations.

Strip

Some Improvement Shown Over January Specifications — Small Lot Buying Continues the Rule

STEADY buying of steel strip is sustaining mill backlogs, although they are light, and some sizes of hot-rolled are being delayed about two weeks at Pittsburgh. Production rates are increasing slowly but gaining each week. Prices as a rule continue steady, with some shading on wide sizes in the Detroit district. Automotive releases are slow and variable.

STRIP PRICES, PAGE 72

Pittsburgh, Feb. 18.—Strip steel specifications are fairly steady and show slight improvement over the corresponding January period. Business is confined mostly to small lots, with automotive buyers showing little tendency to order beyond current requirements. Miscellaneous strip consumers have increased specifications moderately during the past four to six weeks. Mill backlogs still are light, although on some sizes of hot strip, delivery of two weeks is being asked. Mill operations are unchanged at 55 to 65 per cent for hot mills and 50 for cold mills. Concessions continue to be heard of in the Detroit district on wide strip, although on most tonnage 1.80c, Pittsburgh, prevails. The narrow size is 1.90c. Cold-rolled strip generally holds at 2.65c, with higher prices generally applied on small tonnages of a specialty nature.

New York, Feb. 18.—Strip demand is slightly better, but light. Notwithstanding larger backlogs at some mills, consumers have little difficulty in getting delivery in two weeks on hot strip and two to three on cold strip. Prices continue at 1.80c to 1.90c, Pittsburgh, on hot strip, depending upon widths, and 2.65c, Pittsburgh on cold rolled.

Philadelphia, Feb. 18.—Narrow hot strip continues at 1.80c to 1.90c, Pittsburgh, with concessions on especially desirable business.

Youngstown, O., Feb. 18.—Hot-rolled strip demand continues encouraging with some mills operating at 90 per cent and others at 80 per cent. Much of the hot strip now going through is for auto parts makers. Cold-rolled strip needs are not so insistent, with mills at about 55 per cent of capacity. Hot-rolled strip is 1.80c to 1.90c, Pittsburgh and Cleveland, while cold-rolled is 2.65c to 2.75c, same bases.

Cleveland, Feb. 18.—Cold and hot strip orders have not maintained their recent pace. One or two automotive consumers have specified hot regularly but new buying is almost at a standstill. Interest in second quarter is not yet apparent. The 2.65c, Cleveland figure continues on cold, with 1.80c to 1.90c, Pittsburgh, on hot, depending upon width. Miscellaneous consuming lines buy sparingly for current requirements only and not for stock.

Chicago, Feb. 18.—Hot-rolled strip mill operations are gaining gradually, and have reached 65 per cent. Recent automotive releases have been variable. The price is 1.90c to 2.00c, Chicago, according to widths. One cold-rolled producer is operating at 55 per cent, but the average is said to be below 50 per cent. Cold-rolled mills are holding their own in automotive tonnage, but gains are slight. Cold-rolled prices are unchanged at 2.65c, Pittsburgh-Cleveland base.

Canada in 11 months of 1929 exported motor vehicles valued at $42,570,201, an increase of 18 per cent over all 1928.

Cold Finished Steel

Small, Prompt Lots Continue to Rule —Prices Steady

COLD FINISHED PRICES, PAGE 72

Pittsburgh, Feb. 18.—Business in cold-finished steel bars and shafting still is confined to small lots for prompt needs. Most consumers, particularly automotive, are placing little forward tonnage and mills are unable to acquire backlogs. Incoming business and shipments show little improvement over a month ago following a rapid upturn early in January. Some intimations are heard of price advances for second quarter but producers have not changed the 2.10c price. Turned and ground shafting continues 2.45c to 2.90c.

Cleveland, Feb. 18.—Only fair tonnages are noted in cold-finished bars. Most of these are for automotive and allied lines. The market is 2.10c, Cleveland.

Wire

Slow Gain in Buying Except in Manufacturers' Wire—Nail Weakness Continues

MANUFACTURERS' wire is the strongest factor in the wire trade and nails are the weakest. The former is supplying sufficient tonnage to keep production fairly steady. Weather conditions are slowing sales in country districts, except in the South. Northern activity should follow seasonally. Some shading in nails persists in highly competitive areas.

WIRE PRICES, PAGE 72

Chicago, Feb. 18.—Not much improvement is being shown in distribution of common wire products, but a gradual gain is noted in manufacturers' wire. Wire mill operations continue at about 55 per cent. Weather conditions in many rural markets are checking activity in barbed wire, fencing and nails. Despite heavy competition, quotations are reported on the basis of 2.45c, Chicago or western mills, for bright wire, and $2.35 to $2.45 for wire nails.

Worcester, Mass., Feb. 18.—Lessened building operations in New England are reflected in failure of the wire market to show the advance that had been expected. The market generally is dull. Plain bright wire to dealers is 2.55c to 2.65c, base, Worcester.

Pittsburgh, Feb. 18.—Business in wire products is steady at the rate of preceding weeks of this month but fails to equal the activity of January, which was considerably above expectations and seasonally heavy. Little improvement is noted in demand for barbed wire and fencing, except in southern states, although the seasonal upturn in demand from northern districts is expected to start shortly. Manufacturers' wire specifications are fairly steady. Nails continue slow. The nail market generally is $2.30 for standard wire nails, with reports continuing of $2.25 in certain districts. Bright plain wire holds at 2.40c despite weakness in nails.

New York, Feb. 18.—Wire nails appear to have become fairly well established at $2.30, Pittsburgh-Cleveland, for jobber and general trade. Bright plain wire is firm at 2.40c, Pittsburgh-Cleveland, with demand more active.

Cleveland, Feb. 18.—Nails, barbed wire and fence still lag among wire products. Manufacturers' wire is fairly active, although large tonnages are rare. Nobody is buying for stock, realizing that all mills have heavy stocks and can ship immediately. Some producers are offering concessions of $1 to $2 a ton. It is reported that automotive buying has not opened up yet to any appreciable extent.

Nonferrous Metals

Demand in General Is Light but Prices Steady—Zinc Quotations Ease Off and Later Recover—Copper Stocks Rise—Lead Firm

Prices of the Week, Cents a Pound

	Copper: Electro delivered	Copper: Lake delivered	Copper: Casting refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead New York	Lead East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
Feb. 12	Holiday										
Feb. 13	18.00	18.10	17.12½	38.37½	39.00	6.25	6.10	5.22½	23.90	8.75	35.00
Feb. 14	18.00	18.10	17.12½	38.50	39.00	6.25	6.10	5.20	23.90	8.75	35.00
Feb. 17	18.00	18.10	17.12½	38.62½	39.25	6.25	6.10	5.25	23.90	8.75	35.00
Feb. 18	18.00	18.10	17.20	38.75	39.15	6.25	6.10	5.22½	23.90	8.75	35.00

NEW YORK, Feb. 18.—Business in nonferrous metals in the past week was light but most prices were steady. Prime western zinc sold down from 5.25c, East St. Louis, to 5.15c, but later firmed up a little.

The nonferrous metal industry as a whole appears to be operating at about 75 per cent of last year's average. This is a good recovery from the low point of late last year, and closely in line with steel operations. Many metal products are being turned out at less than this rate, and a few at a considerably higher rate. The copper wire and cable department of the industry is outstanding with operations near 90 per cent of last year's record average.

Copper—Light business is being done for prompt shipment nearly every day at firm prices. Export business picked up to a good level about a week ago but in the past few days has been light again. January statistics showed another large increase in refined stocks. Domestic shipments were practically 70,000 tons, or 75 per cent of last year's average. Export shipments were extraordinarily light at 30,000 tons, and it appears certain that February shipments will be larger. Blister stocks increased slightly as production has been curtailed.

Zinc—Second hands became anxious sellers of zinc after the recent statistics were announced, but only one or two producers joined them in selling down to 5.15c, East St. Louis. Demand has been extremely light in the past week or two. The Joplin ore market recovered $2 a ton to $37 on large sales, so that smelters are holding for stronger prices. The spread between metal and ore is about as narrow as at any time in many years, and less than two-thirds of the spread of last summer.

Tin—Prices so far this month have been mostly on the decline, but from the low point of 38.37½c last Thursday, the market has recovered fractionally. Buying has continued light, but a little more interest has been shown for early positions. The outlook for the immediate situation continues uncertain. Supplies still are in excess, but production curtailment seems to be making a little progress, while consumption probably will be on the uptrend over the next few months.

Lead—Light buying has been done for prompt shipment, mostly. Prices are firm and unchanged.

Aluminum—Business has recovered fairly well. Prices are firm.—*Daily Metal Trade.*

In 1574 Lazarus Erker published the first book dealing with assaying alone. These tests consisted in roasting the ore and then separating with a magnet. What the magnet would not pick up was considered worthless.

Mill Products

Base price cents per pound f.o.b. mill, except where otherwise specified

SHEETS	
Yellow brass (high)	23.25
Copper, hot rolled	27.75
Lead, full sheets (cut ½c more)	10.00
Zinc sheet (100-pound base)	$10.50
Zinc strip (100-pound base)	$9.50
Aluminum, flat sheets, up to 10 gage, 3 to 72 inches wide	31.30
SEAMLESS TUBE	
Yellow brass (high)	28.25
Copper	29.25
RODS	
Yellow brass (high, full turnings)	21.25
Naval brass	24.00
WIRE	
Copper	19.87½
Yellow brass (high)	23.75

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	11.25 to 11.75
Chicago	11.00 to 11.25
Cleveland	11.50 to 12.00
St. Louis	10.00 to 10.25
HEAVY YELLOW BRASS	
Cleveland	7.50 to 8.00
HEAVY COPPER AND WIRE	
New York	14.25 to 14.50
Boston	13.75 to 14.25
Chicago	13.50 to 13.75
Cleveland	14.00 to 14.50
St. Louis	10.00 to 10.50
RED BRASS BORINGS	
New York	10.25 to 10.75
YELLOW BRASS TUBING	
Cleveland	8.00 to 8.25
LIGHT COPPER	
New York	12.25 to 12.50
Chicago	11.75 to 12.25
Cleveland	12.00 to 12.50
St. Louis	10.00 to 10.50
LIGHT BRASS	
Boston	6.50 to 6.75
Chicago	6.25 to 6.75
Cleveland	6.00 to 6.50
St. Louis	5.50 to 6.00
ZINC	
New York	2.75 to 3.00
Cleveland	2.25 to 2.50
St. Louis	2.75
ALUMINUM	
Clippings, soft, Cleveland	14.50 to 15.00
Clippings, hard, Cleveland	11.50 to 12.00
Borings, Cleveland	8.00 to 8.50
Cast, Cleveland	11.00 to 11.50
Cast, Boston	10.50 to 11.00
Cast, St. Louis	10.50 to 11.00

Secondary Metals

Remelt aluminum No. 12	16.25 to 16.75
Brass ingot, 85-5-5-5	15.50 to 15.75

Coke By-Products

Shipments Gain Steadily—Toluol More Active—Most Phenol at 17.00c

New York, Feb. 18.—Light oil distillate prices are firm and steady following recent adjustments downward. Shipments against contracts are increasing gradually. February is ahead of last month. A good demand prevails for motor benzol. Toluol is slightly more active, although some consumers turned to solvent naphtha and xylol earlier in the year. Production is normal for this period and stocks are ample but not burdensome. Fair demand prevails for phenol, the bulk of business moving at 17.00c. Buying is well spread and supply well balanced with demand. Naphthalene is unchanged. Shipments are heavier against contracts as spring delivery specifications are placed. Spot demand for sulphate of ammonia is light, but shipments against contracts are fairly brisk at steadier prices. Some business in 100-pound bags is reported at $2.25.

Coke By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot
Pure benzol	$0.22
90 per cent benzol	0.22
Toluol	0.35
Solvent naphtha	0.28
Commercial xylol	0.28
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.17
Per Pound at Producers' Plants	
Naphthalene flakes	0.04½ to 0.05½
Naphthalene balls	0.05½ to 0.06½
Per 100 Pounds Delivered	
Sulphate of ammonia	$2.10 to $2.20

Quicksilver Is Steady

New York, Feb. 18.—Quicksilver is selling at $124 a flask, and is steady.

Warehouse

Selling More Lively Than January—Sales Still Below Comparative 1929 Total—Demand Covers Wide Range Of Products

SUBSTANTIALLY improved markets find total tonnages still below those of 1929 to the same date. Cincinnati sales are 10 per cent higher than in January. Demand at Buffalo is accelerated as mill deliveries become deferred. Buying has subsided materially at St. Louis. Tonnage is well distributed at Chicago and elsewhere. Price shading to move slow items is encountered.

Buffalo—Demand is growing steadily. Unexpected order accumulation at mills forces some purchasers to cover needs partially from warehouses. Sheets have shown considerable improvement.

Pittsburgh—Demand shows substantial improvement but it still is below the 1929 rate. Buying is confined to small lots. More consumers are entering the market. Prices are slightly steadier, with some shading concessions of 5 to 10 cents per 100 pounds being noted on bars, shapes and plates.

Detroit—Conditions show little if any change. The tone of orders seems somewhat better than in January. Briggs Mfg. Co., which started producing DeSoto bodies, has had to do some buying.

Cincinnati—Prices are firmer. Business is possibly 10 per cent better than in January. Jobbers here may not put into effect the quantity differentials on cold-finished steel announced elsewhere.

Chicago—Sales remain behind a year ago, although a gradual pick-up is reported. Demand is well distributed. Quotations for common wire products, including nails, now are more stable.

St. Louis—Business the past ten days was less active than in late January. All buy sparingly. Even southern activity has subsided. Sheets about hold their own. Quoted prices are unchanged, but slight shading to move slow items is noted.

Philadelphia—Warehouse market is unchanged. Demand is maintained at the January average.

Cleveland—Some improvement in demand is reported here. February business is well above January but does not come up to February, 1929. Prices are unchanged.

Iron ore was first exported from the American colonies by the Virginia Co., near Jamestown, N. Y., in 1608. The ore was smelted in England and sold to the East India Co. for 4 pounds per ton.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Houston	3.00c
Los Angeles	3.30c
New York†††‡‡	3.25c
Philadelphia*	2.80c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.04c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
New York††	3.25c
Philadelphia*	2.80c
St. Louis	3.15c
Tulsa	3.75c to 4.04c

REINFORCING BARS

Baltimore	3.31c
Boston	3,265c to 3.50c
Buffalo	2.95c
Chattanooga	3.25c
Cincinnati	3.15c
Cleveland	2.25c to 2.44c
Detroit	2.30c to 3.00c
Houston	3.00c
Los Angeles cl.	2.40c
Los Angeles lcl.	2.70c
New York	2.65c to 3.10c
Philadelphia	2.65c to 3.00c
Pittsburgh	2.75c
San Francisco cl.	2.30c
San Francisco lcl.	2.60c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.25c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Houston	3.25c
Los Angeles	3.30c
New York†††‡	3.30c
Philadelphia*	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

PLATES

Baltimore	3.25c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼ in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New York‡‡	3.30c
Philadelphia*	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	2.75c to 4.14c

NO. 10 BLUE ANNEALED

Baltimore	3.60c
Boston 3/16-in.	3.915c
Buffalo	3.50c
Chattanooga	3.75c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Houston	3.90c
Los Angeles	4.00c
New York ‡‡	3.50c to 3.90c
Portland	3.75c
Philadelphia*†	3.25c
Pittsburgh**	3.25c to 3.35c
San Francisco	3.90c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.54½c
Tulsa	4.20c to 4.34c

NO. 24 BLACK SHEETS

Baltimore *†	3.75c
Boston	4.85c
Buffalo	4.20c
Chicago	4.05c
Cincinnati	4.05c
Cleveland***	3.75c
Detroit	3.95c
Los Angeles	4.90c
New York	3.65c to 3.90c
Philadelphia*†	3.80c
Pittsburgh**	3.65c to 3.75c
Portland	4.90c
San Francisco	4.90c
Seattle	5.00c
St. Louis	4.25c
St. Paul	3.79c
Tulsa	4.34c

NO. 24 GALVANIZED SHEETS

Baltimore*†	4.50c
Boston	5.60c
Buffalo	4.70c to 4.85c
Chicago (local delivery)	4.60c
Chicago (outside shipment)	4.35c to 4.60c
Cincinnati	4.90c
Cleveland***	4.50c
Detroit	4.60c
Houston	5.40c
Los Angeles	5.30c
Pittsburgh**	4.30c
Philadelphia*†	4.45c
Pittsburgh**	4.40c
Portland	5.50c
San Francisco	5.30c
Seattle	5.50c
St. Louis	4.85c
St. Paul	4.58c
Tulsa	5.10c to 5.35c

BANDS

Baltimore	4.00c
Boston	4.015c to 5.00c
Buffalo	3.65c
Chattanooga	3.45c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.25c to 3.65c
Detroit 3/16-in. and lighter	3.30c
Houston	3.65c
Los Angeles	4.15c
New York‡‡	3.75c
Philadelphia*	3.30c
Pittsburgh	3.25c
Portland	4.00c
San Francisco	3.75c
Seattle	4.00c
St. Paul	3.50c
Tulsa	4.50c to 4.69c

HOOPS

Baltimore	4.00c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	3.75c
Cincinnati	4.05c
Cleveland	3.25c to 3.65c
Detroit, No. 14 and lighter	3.80c
New York‡‡	4.25c
Philadelphia*	3.55c
Pittsburgh	4.25c
Seattle	5.00c
St. Paul	4.00c

COLD FINISHED STEEL

	Rounds, hexagons	Flats, squares
Baltimore (c)	3.50c	(a) 4.00c
Boston	3.55c	4.05c
Buffalo	3.95c	4.45c
Chattanooga*	3.85c	4.35c(d)
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles (a)	4.50c	.....
New York	3.50c	4.00c
Philadelphia*	3.40c	3.90c
Pittsburgh	3.70c	4.20c
Portland (a)	4.50c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	4.75c	.....
St. Paul (a)	3.85c	.....
Tulsa	4.64c	5.14c

(a) Rounds only; (d) Squares only.

COLD ROLLED STRIP

Boston, 0.100-inch 500 pound lots	5.30c
Buffalo	5.85c
Chicago (b)	6.10c
Cincinnati	7.15c
Cleveland (b)	5.95c
Detroit	5.80c
New York	5.15c
Philadelphia (c)	5.15c

(b) Net base, straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	13.00c
Iron bars, round	6.10c
Iron bars, flats and squares	6.50c

*Plus quantity differentials. ‡‡Minus quantity differentials. ††Domestic bars. **Less than 25 sheets. *†50 or more bundles.
***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

Pacific Coast

Light Demand Continues as Larger Tonnages Hold Back—Much in Prospect

PROSPECTIVE business on the coast is considerable but current bookings for the most part are in lots of less than 100 tons. Pipe seems more active than other markets and considerable tonnages are up for early disposal. Import figures show some increase in foreign goods. General prospects are good for important buying when weather conditions improve.

San Francisco, Feb. 15.—(*By Air Mail*)—Movement of iron and steel products on the Pacific Coast this week was not heavy, but improvement is reported in most lines and indications are favorable for a good first quarter. Over 200 executives of iron and steel concerns attended the sixth annual steel conference at Del Monte, Calif., Feb. 13 to 15 and as a result better and closer co-operation is looked for among the various groups involved.

Imports of iron and steel products on the Pacific Coast during October, 1929, figures for which have just been received, show an increase in tonnage over September imports, except in structural shapes. The aggregates for the major items are as follows, in tons:

	Oct. 1929	Sept. 1929	Oct. 1928
Pig iron	3539	2080	2735
Coke	4433	1481	3916
Bars	729	709	2024
Shapes	2106	3743	2021
Cast iron pipe	3667	1488	3015
Tubular products	2130	518	3667

Pig Iron and Coke

Foundry pig iron and coke are quiet, sales and inquiries being confined to small lots for prompt shipment. No changes in quotations are noted.

Bars, Plates and Shapes

Bids will be opened Feb. 27 for a bridge over the Klamath river near Keno, Oreg. Prices in the San Francisco district on out-of-stock material continue at 2.30c, base, on carload quantities, and at 2.60c on lesser lots. Merchant bar prices remain unchanged at 2.35c, c.i.f. Demand for the latter class of material is light.

The Standard Oil Co., San Francisco, has placed 400 tons of plates with an unnamed eastern mill and is in the market for 640 tons. The Shell Oil Co., San Francisco, awarded 350 tons for underground tanks to the Western Pipe & Steel Co. Prices are weak at 2.25c, c.i.f., coast ports, and desirable lots have gone at several dollars a ton under this figure.

The California Steel Co. has booked 250 tons for a garage in Honolulu and the Western Iron Works was awarded 100 tons for a factory in San Francisco. Bids will be called for shortly for 750 tons for the Lane hospital addition, San Francisco, and bids will be opened Feb. 25 for 1400 tons for a hospital at Presidio, San Francisco, involving 1400 tons. Plain material continues firm at 2.35c, c.i.f.

Other Finished Material

While awards of cast iron pipe this week were in lots of less than 100 tons a fair tonnage is pending. Glendale, Calif., will open bids Feb. 20 for 1545 tons. Pending business aggregates over 3100 tons. Standard steel pipe and oil country goods are quiet.

Tonnage In Prospect

Seattle, Feb. 12.—Steel awards in the Pacific Northwest this week were confined to contracts of less than 100 tons. However, several important projects are to be let at once and tonnages pending are large especially for reinforcing, shapes and cast iron pipe. Mill prices are firm. Plates seem to be holding at 2.25c following a recent period of weakness.

Pig Iron and Coke

Foundry operations are below normal. Some larger plants are fairly busy with cannery and sawmill contracts but others are practically idle. Spring work has not yet appeared. Buying of pig iron and coke is limited. Tyneside coke at $14 and Victoria at $14.50 are arriving in small lots by water. The first order for Alabama coke, quoted at $13, delivered, foundry, has been placed. One firm has purchased 100 tons of Burn iron at $26. Columbia No. 1, quoted at $26.50 in car lots, is being purchased as necessary for quick delivery. A small order of Mayari iron, quoted at $43, has been bought by a local plant for special work.

Bars, Plates and Shapes

Several important tonnages of reinforcing bars are pending and should be announced within a day or two. These include the local immigration station and the Tacoma Medical-Dental structure. Northwest Steel Rolling Mills booked a small lot for the Webster school addition.

The largest shape project pending involves 1800 tons for the Meier & Frank department store, Portland, Oreg. A bridge in Snohomish county, Wash., calls for 200 tons, bids Feb. 24. Contracts taken by local plants in less than 100-ton lots are estimated at 500 tons per month.

Inquiry for cast iron pipe continues active and considerable tonnage is about to be awarded. American Cast Iron Pipe Co. has closed for 150 tons of 8-inch monocast for the King county airport. Foreign pipe submitted the low figure for a contract at Tacoma, which is still pending. Jobs at Port Townsend, Montesano, Wash., Monmouth, Oreg., and Pocatello, Ida., are pending. Bids will be opened at Brighouse, B. C., Feb. 17 and at Richmond, B. C., Feb. 15 for important tonnages. Portland will receive bids next week for about 3000 tons of cast iron pipe.

Great Lakes Steel Buys Special Locomotives

Two 70-ton 300-horsepower oil-electric locomotives, unique in design, have been purchased by the Great Lakes Steel Corp. for use in its Detroit plant. These locomotives, to be built by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., will perform the usual steel plant services such as moving ladles of molten metal, ingot buggies and handling switching and weighing operations.

To protect these locomotives from the heat to which they will be subjected they will be painted with a heat resisting paint. The windows, exceptionally large and low, will be glazed with a special glass to withstand a temperature equal to that of boiling water. Safety steps will be illuminated. Lighted bullseyes on the front and rear of the cab will indicate at once whether the engineer is running the locomotive from the right or left side. A similar oil-electric switching locomotive now is in operation at the Butler, Pa., plant of the American Rolling Mill Co.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	25.00 to 26.00

*C.i.f. duty paid.

Steel Barrel Shipments Rise in 1929

Cleveland, Feb. 18.—Steel barrel shipments for 1929, as reported by members of the Steel Barrel Manufacturers' institute, Cleveland, show a total of 6,089,686 units or 49.3 per cent of capacity. This compares with a total shipment of 4,284,885 steel barrels, or 54 per cent of capacity in 1928, when fewer members were reporting.

More than 40 per cent of the employes of the General Electric Co. subscribed $7,605,910 to the eighth annual offering of G. E. Employes Securities Corp. bonds. At the close of 1929 there were 30,484 bondholders, an increase of approximately 1500 over 1928.

Belgians Plan Unusual Foundry Convention

The foundry convention to be held in Liege, Belgium, June 22-28 will be an unusual one, as it will be conducted in conjunction with an international congress of mines, metallurgy and applied geology on the occasion of the centenary celebration of the independence of Belgium. In connection with this event an exhibition will be held with sections in Liege, Brussels and Antwerp. The leading foundry associations of Europe will participate in the convention.

The metallurgical section of the international congress will be divided into subsections under the following headings: Blast furnaces; steel and ferroalloys; foundry; nonferrous metals; nonferrous alloys; and fuel. The association Technique de Fonderie of Belgium is entrusted with the organization of the foundry section. A feature of the convention will be an organized visit to the exhibition. Visits also will be made to the most important iron and steel works of Belgium, and possibly the Grand Duchy of Luxemberg, including the principal industrial laboratories.

Rolling Mill and Gulf States To Merge?

Cleveland, Feb. 18.—Negotiations for a merger of the American Rolling Mill Co., Middletown, O., and the Gulf States Steel Co., Gadsden, Ala., are reported under way but lack verification. Gulf States recently took out a license from American Rolling Mill to build a continuous sheet mill under the latter's patents.

Deposits of stock of the constituent companies of the Republic Steel Corp. merger have been extended from Feb. 17 to March 1.

Issues Buyers' Guide

The Cleveland chamber of commerce has published a buyer's guide, compiled by the manufacturers and the industrial development committees, showing more than 10,000 separate items manufactured in Cleveland by 2250 firms, and 1800 jobbers handling 6000 different articles.

The guide lists Cleveland manufacturers, articles manufactured in Cleveland, jobbers and wholesalers, articles jobbed or wholesaled out of town, concerns with local branch offices, out of town concerns having Cleveland representation, trade names for Cleveland manufactured articles and trade names for articles locally sold but made out of town. The Cleveland buyer's guide sells for $2.

Airplane Production in 27 Per Cent Gain

Production of airplanes, engines and spare parts in the United States during 1929 represented a valuation of $98,000,000, according to figures compiled by the Aeronautical Chamber of Commerce, New York, and published in "The Aircraft Year Book for 1930." This represents an increase of 58 per cent over the $62,000,000 valuation in 1928.

Total production of planes in 1929 was 6034, of which number 5357 were for commercial use and 677 were for military purposes. In spite of a 44.4 per cent decrease in military planes, as compared with 1928, the total production increased 27 per cent. Major aircraft manufacturers numbered 96 in the past year, against some 53 in 1928.

Engines built in 1929 totaled 7378, against 3263 in the preceding year. Companies engaged in their manufacture numbered 25, as compared with 12 in 1928.

International Standards Work Progressing

Under auspices of the International Standards association, of which the American Standards association is a member, a technical conference will be held in Paris in May. Seventeen foreign countries have standardizing bodies represented in the International Standards association and since the international conference on standardization in New York in 1926 these groups have established international co-operation on a number of technical projects. This has been accomplished through the work of various technical committees.

Included in the 24 standardization projects now being worked out are: Screw threads; ball and roller bearings; pipe and pipe fittings; rivets; ships' elements; test pressures for the acceptance of new stationary boilers; center heights of machine shafts; couplings between driving and driven machines; shafting keys; iron and steel classification; standard diameters; and aeronautics.

Seven of these 24 subjects will come up for detailed discussion at the forthcoming Paris meeting.

Senate Lowers Duties on Cast Pipe, Sponge Iron, Wire Rods, Aluminum

WASHINGTON, Feb. 18.—United States senate this week in going over the tariff bill for individual amendments has made several changes in the iron and steel schedule.

Senator Barkley, of Kentucky, proposed that the rate on cast iron pipe should be reduced from 30 per cent, as provided by the finance committee, to 20 per cent. Senator Kean, of New Jersey, opposed the reduction, urging that 30 per cent be retained. As the amendment passed the senate a compromise of 25 per cent was accepted.

By a vote of 39 to 38 the senate adopted the Barkley amendment striking out the house provision for an additional rate of 1.30c on hollow bars and hollow drill steel, valued at more than 4 cents per pound.

By a vote of 41 to 37 the senate also adopted amendments on wire rods valued at more than 4 cents per pound, reducing the rate from 20 per cent, as provided for by the house and finance committee, to 0.60c per pound. The wire rope rate was reduced from 40 to 35 per cent. The rate on sponge and granular iron was reduced to 75 cents per ton. An amendment to restore boron carbide to the free list was defeated. The rate now in the bill is 25 per cent.

The rate on crude and scrap aluminum was reduced from 5 cents to 2 cents per pound. Also the rate on sheet and bar aluminum was reduced from 9.00c to 3.50c per pound.

The senate also amended the manganese paragraph to include manganiferous iron ore having more than 10 per cent manganese content at 1.50c per pound. Senator Barkley announced that he would bring up at any time during the tariff discussion the elimination of all alloy provisions in the iron and steel schedule. There being no objection, he can do that without getting unanimous consent.

The senate completed its work on the iron and steel schedule today. However, there is a possibility of changes in this schedule when the bill is reported from the committee of the whole to the senate proper. Few alterations, if any, are expected at that time.

Reports Good Year; Changes Name to the Wellman Engineering Co.

CLEVELAND, Feb. 18.—Wellman Engineering Co. is the new name adopted today by the Wellman-Seaver-Morgan Co. at the annual meeting of shareholders. Explaining the change, a statement by the company says:

"The new name is in keeping with the modern trend for brevity and is considered more descriptive of its type of business, which is the designing and building of apparatus for handling and transporting raw materials from the mine to the finished products, including steelworks equipment, car dumpers of all types, coke oven machinery, port and terminal equipment, hoisting machinery for mines, special cranes, coal and ore handling machinery, gas producers, valves, flues, etc.

"The combination of its highly developed engineering organization with its modern manufacturing plant makes possible not only the conception and design of efficient machinery, but also the constructing, manufacturing and installation of the apparatus."

Directors declared the 80th quarterly dividend of 1.75 per cent on preferred stock, payable April 1. Officers of the company were elected as follows: John A. Penton, chairman of the board and treasurer; George W. Burrell, president and general manager; S. R. Willock and A. E. Gibson, vice presidents; and C. C. Clayton, secretary.

There was no change in the board of directors, the following having been re-elected: John A. Penton, G. W. Burrell, S. R. Willock, A. E. Gibson, Francis Seiberling, H. J. Crawford, Atlee Pomerene, John T. Webster and James Foster-Smith.

The original Wellman-Seaver Engineering Co. was incorporated in 1896 by Samuel T. Wellman, his brother Charles H. Wellman, and John W. Seaver. The company was highly successful in the designing and building of steelworks throughout the world, and in time demand for its specialties became so great that it decided to erect its own manufacturing plant in which its product could be fully controlled. In 1901-1902 the plant at Central avenue and East Seventy-first street, Cleveland, was constructed.

In 1902, for recognition of the ability of Thomas R. Morgan Jr., actively associated with the company's sales work, the name of the company was changed to the Wellman-Seaver-Morgan Engineering Co., and in 1903 the Wellman-Seaver-Morgan Co. was incorporated to acquire the properties not only of the Wellman-Seaver-Morgan Engineering Co., but of the Webster, Camp & Lane Co., Akron, O., which manufactured mining machinery, ore and coal handling equipment and corliss engines.

Samuel T. Wellman, father of the open-hearth furnace in America, devoted many years to the invention and improvement of steel plants and steelmaking equipment. The Wellman open-hearth charging machine, patented by him in 1888-1889, is credited with having contributed more to the open-hearth process than any other improvement. Mr. Wellman died on July 11, 1919. George W. Burrell, president and general manager, entered the employ of the Wellman-Seaver Engineering Co. in 1898 as a draftsman, advancing steadily through various important positions until his election as president in 1928.

Financial report for year ending Dec. 31, 1929, reveals assets totaling $4,627,968, common and preferred stock aggregating $3,253,440, and profit for the year was reported by President Burrell to be $327,992, or the largest in the company's history, except for the war period. Mr. Burrell also reported that billings for the year just passed as well as new business booked were the largest since 1921 while the percentage of profit to sales was the highest in the company's history. Unfilled orders Jan. 1 showed an increase over the same time last year of 109 per cent.

President Burrell also stated that not only is good business for the company assured for the first half of this year, but that the outlook for the remainder of the year is promising. Mr. Burrell and the oganization were praised for the good showing.

Mexico Orders Sugar Mill Equipment

Mexico City, Feb. 18.—Contracts have been given the Fulton Iron Works, St. Louis, for machinery for a 3,000,000 peso (about $1,500,000) sugar refinery to be built by a Mexican enterprise headed by former President Plutarco Elias Calles, his son Rodolfo and Gov. Aaron Saenz of the state of Nuevo Leon, it is reliably learned here. Contracts for other metal work connected with the plant will be awarded the Monterrey Iron & Steel Works, a Mexican concern with headquarters in Monterrey.

The refinery will be built in the Rio Mante district, near Villa Juarez, state of Tamaulipas, and a short distance from Tampico. Work on the mill will be completed in about eight months.

American interests here are completing plans for a $1,000,000 (U.S.) sugar central on a 37,000-acre ranch near Vera Cruz. It is understood that steel required for this proposed plant will be purchased to a large extent in the United States.

Blast Furnace Model at Chicago Centennial

A modern blast furnace plant, operating in model, complete with ore boat, bridges, ore dock and trestle, will be one of the features of the science exhibit at the Chicago Centennial in 1933 if suggestions adopted by the National Research council's science advisory sub-committee on iron and steel are approved.

Another model which will indicate the applications of science to the development of the iron and steel industry will be a large open pit mine with models in motion, showing the old methods of loading boats with wheelbarrows as compared to the present stage of development, with loading docks, and the lifting and dumping of freight cars bodily. It is also planned to demonstrate the latest methods of locating ore deposits with the magnetic needle.

The iron and steel sub-committee, under chairmanship of W. H. Eisenman, secretary of the American Society for Steel Treating, has made recommendations to the science advisory committee, embodying depiction of the chemistry and physics of steel treatment, the open-hearth and bessemer process, metallography and heat treatment, mills, foundry practice and electric steel.

Mines Bureau Publishes Manganese Results

The bureau of mines has just published a new technical paper, No. 466, by B. M. Larsen, which deals with a recent study of the characteristics of low-carbon manganese steel and of the effect of manganese on abnormality in case-carburizing steels. Certain phases of the problem could not be finished entirely, but some rather marked effects of manganese on the distribution of carbides have been observed, and the results obtained are enlightening in relation to the modifying effects of manganese on low-carbon steels.

The lightning rod was invented by Benjamin Franklin in 1751. His original rods were made of iron.

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

EXACT WEIGHT SCALE CO., Columbus, O., has moved into its new office and factory building at 944 West Fifth avenue. The new plant is 150 x 315 feet and space is owned adjoining the structure for expansion. The company was founded in 1916 as the Smith Scale Co., with 8 employes, $10,000 capital and 1500 square feet of floor space. Employes now number 125, capital 10,000 shares no par value and the plant contains 47,000 square feet. Ralph H. Beaton is president, John G. Sims vice president and general manager, Edward G. Reyer treasurer, K. B. Neff secretary and assistant treasurer.

* * *

JARDINE, MATHESON & CO. LTD., importers and exporters, New York, have moved general offices to 470 Fourth avenue.

* * *

CAPITOL STEEL & IRON CO., Oklahoma City, Okla., has opened a branch sales office at 601-2 Daniel building, Tulsa, in charge of Victor C. Anderson.

* * *

YOUNGSTOWN SHEET & TUBE CO., Youngstown, O., has moved its Cleveland offices from the Union Trust building to 2400 Terminal Tower building.

* * *

AMERICAN ROLLING MILL CO., Middletown, O., has moved its sales office at Philadelphia to 2020 Lewis Tower. W. S. Stephenson is manager.

* * *

CHESAPEAKE CRANE CORP., Baltimore, has appointed H. H. Knowles, 625 Third street, San Francisco, its representative in coast and western states for its standard and special electric cranes.

* * *

CUTLER-HAMMER INC., Milwaukee, has moved its Detroit sales office to 2755 East Grand boulevard. Warehouse facilities have been obtained for carrying stocks of motor control, wiring devices, safety switches and other products.

* * *

INTERNATIONAL SUPPLY CO., Tulsa, Okla., has been appointed exclusive distributor in Oklahoma, Kansas and northwest Texas for the Titusville Iron Works, Titusville, Pa., manufacturer of engines, pumps and oil field equipment.

* * *

ELLIOTT BLAIR STEEL CO., New Castle, Pa., which has been in receiver's hands since fall, is to be placed in operation shortly on production of cold-rolled steel. Noah W. Elliott Sr. and J. R. Foster are receivers.

* * *

BURT CORP., Tulsa, Okla., manufacturer of oil well swabbing equipment, has moved its warehouse and office from 316 Frankfort street to 320 East Eleventh street, where it is occupying a new building. L. G. Burt is president and general manager.

* * *

AMERICAN FORGE & MACHINE CO., Canton, O., manufacturer of drop and drawn forgings, has elected H. L. Barnes president and general manager, O. M. Abt vice president, E. C. Keafer secretary and treasurer. The board of directors has been added to by the election of S. M. Schultz, A. J. Hackman and O. M. Abt.

* * *

MACHINERY & SUPPLY CO., Joplin, Mo., has changed its name to Joplin Machinery & Electric Co. The organization and personnel is not changed. The company is distributor for Westinghouse Electric & Mfg. Co., Pomona Pump Co., George D. Whitcomb Locomotive Co., Gardner-Denver Co., Deming Pump Co., American Blower Co. and Dings Magnetic Separator Co.

* * *

EGYPTIAN FOUNDRY & MFG. CO. INC., Belleville, Ill., has bought the plant of the Lincoln Foundry Inc. and will continue the manufacture of stoves and castings and a general jobbing business. Officers of the new company, which has just completed organization, are: President, William Arey; vice president, Frank J. Wagner; second vice president, Ewald Glueck; secretary Edward A. Ruff; treasurer, Fred Roesch; manager, Minard Van Eisenga. Alex Ehret and Erwin Ehret, president and secretary of the former Lincoln foundry, are building a foundry at Mt. Carmel, Ill.

* * *

KORTICK MFG. CO., San Francisco, manufacturer of pole line hardware, drop forgings, bolts, nuts, washers and other iron and steel products, has a drop forge plant with three board drop hammers, of 2000, 1200 and 600 pounds capacity, with cold trim presses and a diemaking plant in which are produced all the forged dies used in the company's production. Jobbing production for others is also undertaken.

* * *

GLOBE STEEL TUBES CO., Milwaukee, manufacturer of high chrome and chrome nickel tubes, frequently called stainless tubes, has arranged to handle sales of this class of tubes through its own eastern sales office in New York, covering the eastern district, instead of through independent agencies. R. R. Lally, manager of sales, who is in charge of the New York office, will have direct supervision of stainless tubing sales.

* * *

ELSEY RIVER TRANSPORTATION LINE, Pittsburgh, operating the steamer DONALD BIRMINGHAM, has had it in operation continuously from June 20 to Jan. 15 delivering barges from shipyards in the Pittsburgh district to the Inland Waterways Corp. at Cairo, Ill. The barges were built at the yards of the American Bridge Co., Riter-Conley Mfg. Co. and Midland Barge Co. Each is of 2000 tons capacity and measures 230 x 45 x 11 feet. They were towed 981 miles from Pittsburgh to Cairo.

* * *

HORACE T. POTTS & CO., Philadelphia, jobbers in iron and steel products, are establishing a plan for old-age protection for employes. Arrangements are being made with an insurance company for purchase of annuities by employes, the company paying more than half the premiums on whatever protection the employe elects. A fund of $20,000 is being set aside to cover these payments in case of slack business. The Potts company has a number of plans in force for the benefits of employes. Profit

sharing yielded a bonus in 1929 equal to 4 per cent of annual wages; group life insurance is carried by the company with provision for the employe taking additional protection at a low rate; wages are paid weekly without deducting for illness or other legitimate cause of absence; labor turnover is kept small by giving the best possible continuity of employment in slack times.

* * *

EASTON CAR & CONSTRUCTION CO., Easton, Pa., has moved its New York offices to 10 East Fortieth street.

* * *

REEVES & SKINNER MACHINERY CO., St. Louis, has been appointed Missouri and southern Illinois sales representatives for American Fluid Motors Co., Philadelphia.

* * *

FOUR-WHEEL AUTOMATIC HYDRAULIC JACK CORP., Chicago, has purchased a 2-story and basement industrial building, containing 85,000 square feet of floor space, at 3845 Ravenswood avenue for its own occupancy.

* * *

DICKSON CO., 310 South Michigan avenue, Chicago, manufacturer of thermostatic control devices, has bought a newly completed 2-story factory and 1-story office building, 131 x 191 feet, at 7418-28 Woodlawn avenue, Chicago.

* * *

YALE & TOWNE MFG. CO., Stamford, Conn., has opened a sales office at 534 Gurney building, Syracuse, N. Y., for sales and service of its electric industrial trucks, tractors, trailers hand lift trucks and skid platforms. H. R. Bungay Jr. is in charge, assisted by George Sherrill.

* * *

PONCA SPECIALTY MFG. CO., Ponca City, Okla., recently organized to manufacture oil field specialties, has started construction of its plant and will soon be in production. L. J. Mildren is president, A. R. Peters vice president, and James H. Hyde secretary-treasurer.

* * *

BI-METALLIC PRODUCTS CO., Pittsburgh, which plans to locate its factory at Charleroi, Pa., has elected the following to the board of directors: Taylor Allderdice, chairman of the board; Norman Allderdice, Harry R. McMahon, W. E. Moore, A. E. Strasser, all of Pittsburgh; and Enos W. Curtin and Herbert M. Wallace, New York. The company has been formed to manufacture bi-metallic products and plans to occupy the plant formerly used by the Charleroi Steel & Foundries Co. Officers of the company are: President, A. E. Strasser; vice president, Norman Allderdice; vice president, James C. Curtin, New York; and secretary-treasurer, Herbert H. Hallsted, of New York.

* * *

PITTSBURGH BRASS MFG. CO., Pittsburgh, has been taken over by H. F. Brennan, O. W. Oppenheimer and A. M. Oppenheimer of Pittsburgh, and W. P. Todd of New Bethlehem, Pa., but will continue business under the same name. Mr. Brennan is president, Mr. Todd is secretary-treasurer, and O. W. Oppenheimer vice president.

* * *

SPRINGFIELD BRONZE & ALUMINUM CO., Springfield, Mass., is about to occupy an addition to its plant, 30 x 140 feet, 60 x 60 feet and 30 x 60 feet. The larger building will house offices, locker rooms and pattern shops, the second molding and manufacturing space and the latter pattern storage. Joseph R. Gould is president and J. C. Tarbell treasurer.

* * *

FITCHBURG STEAM ENGINE CO., Fitchburg, Mass., has been bought by a new company, the Fitchburg Engine Corp., largely composed of former executives of the Putnam plant, owned by Manning, Maxwell & Moore Inc. The plant will continue the manufacture of steam engines, machine tools and mechanical equipment. The company includes William O. Forman, Philip E. Arthur, Erne T. L. Fickett, Roland G. Holmes and Arthur A. Stacy.

* * *

HARBISON-WALKER REFRACTORIES CO., Pittsburgh, reports for 1929 an increase of 19.1 per cent in net profit over 1928. Net income last year was $5,256,413, compared with $4,412,533 during the preceding twelve months. Total surplus was increased by $1,893,462 during the year to $8,992,502. The company recently declared an extra dividend of 25 cents a share on the common stock, in addition to the regular quarterly dividend of 50 cents a share.

* * *

DURALOY CO., Pittsburgh, has completed an arrangement with the firm of A. T. Kathner & P. Damiron, consulting engineers, 26 Rue Bayard, Paris, to furnish service and technical information to European builders of the Kathner normalizing furnace. Mr. Kathner formerly was associated with the Duraloy Co. at Pittsburgh and Mr. Damiron formerly was assistant manager of the Forges de Gueugnon, Gueugnon, Saone et Loire, France, at whose plant the first Kathner furnace in Europe was built. T. R. Heyward, president of the Duraloy Co., has returned from a business trip to Europe during which he made this connection. Two furnaces are being built at present for German steelworks and one for the Fiat works, Turin, Italy.

* * *

JAMES REES & SON CO., Pittsburgh, boatbuilder since 1845, is to close its plant at once and equipment patterns sold. Capt. Thomas M. Rees, president and general manager, came to this decision after a change in grade of a street, which prevented efficient operation. The shop and yard has constructed about 1000 steamers and barges. They have been built for use on all waters of the world, of wood and later of steel. The plant contains a machine and pattern shop fully equipped.

* * *

J & W. JOLLY INC., Holyoke, Mass., until recently devoting itself principally to the manufacture of paper mill machinery and water wheels, has recently added other lines. The plant has been improved by the installation of new boring, precision grinding equipment and other machinery. The plant consists of machine shop, gray iron foundry, forge and pattern shop. The machine shop is equipped with machine tools suitable for producing heavy machinery such as is used in rubber factories, paper mills and machine tool establishments, and small precision parts. The foundry has two cupolas and equipment for producing castings up to seven tons each. Its machine tool equipment enables it to carry its service from the making of patterns through to the finished product.

* * *

AJAX METAL CO., Philadelphia, manufacturer of secondary nonferrous ingot metals, is observing its fiftieth birthday. J. G. Hendrickson and F. J. Clamer founded the business in 1880 in a small plant. Annual output now is about 30,000,000 pounds of ingots. It has under construction an addition of 80,000 square feet, the present plant covering 100,000 square feet. The additional space will be used for storage and handling of raw material. The original product was a bearing metal of copper, tin and lead, the lead being a new ingredient at that time. The company had a rolling mill in its early days, producing a general line of nonferrous products. This later was abandoned and the company now makes only nonferrous ingots, including white metal alloys. Development of an electric melting furnace has been an important feature of the company's

(*Concluded on Page* 94)

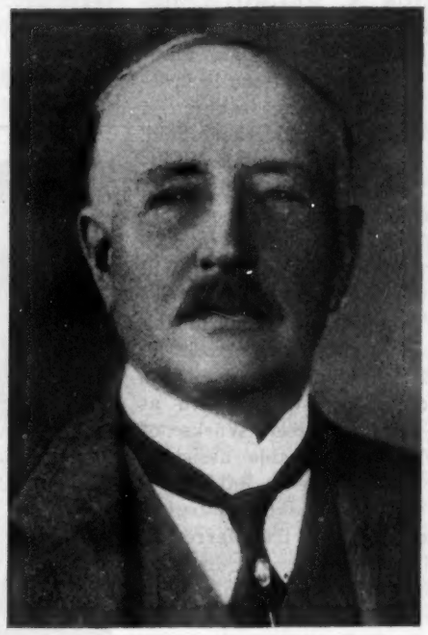
Industrial Men in the Day's News

Herbert C. Ryding, President, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

BRITISH born, and educated in Germany for the legal profession, he early became an iron works apprentice in England.

AMERICANS served by him as guide on an inspection tour offered him an opportunity to come to America, which gave him his first opening.

BIRMINGHAM, Ala., Louisville, Ky., Johnstown, Pa., Lorain, O., and again Birmingham, have been the scenes of his activities during the past 50 years.



IN THE quarter century to terminate two years hence, Herbert C. Ryding has risen from assistant to the vice president to the presidency of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. His appointment to that office, effective Feb. 1, was made in New York Jan. 28, as noted in IRON TRADE REVIEW of Jan. 30. He succeeded George Gordon Crawford, who resigned Jan. 31, after serving in that capacity for 22 years, to become president of the Jones & Laughlin Steel Corp., Pittsburgh.

Mr. Ryding's connection with the Tennessee company has run parallel to that of Mr. Crawford, both having become identified with it in 1907 just after it was purchased by the United States Steel Corp., from the men of Tennessee and Alabama who previously had controlled and operated it. Both have since been continuously identified with its growth in importance as a producer of rails, sheared plates, black and blue annealed sheets, shapes and tie plates.

Initial work by Mr. Ryding for the company was as assistant to the vice president, those duties being assumed in 1907. He was made vice president in charge of operations ten years later and was serving in that capacity at the time of his promotion to president.

Mr. Ryding was born in Lymington, Hampshire, England, where he received his early education. Later he spent four years in the University of Heidelberg in Germany and then continued his studies under a private tutor preparatory to studying law. A short time spent in an English law office, however, eradicated that tendency and he decided he did not care for the legal profession as a life work. He became an apprentice in the iron works of Townsend, Wood & Co. in South Wales. Opportunity came along one day when a party of Americans made an inspection tour of the plant and young Ryding was designated as its guide. The visiting party included A. J. Moxham, who later became prominent in the Birmingham, Ala., industrial district. He was much impressed by the young guide's courtesy and evident knowledge. Mr. Moxham engaged him in conversation, and later prevailed upon him to come to America, to locate in Birmingham, and to become night foreman of the Birmingham Rolling Mills. Mr. Moxham later withdrew from the Birmingham district to start the Brook Street Mill in Louisville, Ky., and Mr. Ryding went along, remaining from 1884 until 1888. The Louisville interests then known as the Johnston Steel Co. built a plant at Johnstown, Pa., to roll street railway girder rails and Mr. Ryding changed his sphere of labor to Johnstown. He became prominently identified with its progress and operations until the plant was moved to Lorain, O. He was appointed superintendent there, remaining until 1907 when he returned to Birmingham to become assistant to John A. Topping, then president and in charge of operations of the Tennessee Coal, Iron & Railroad Co. at Birmingham.

An engineer of ability, a man well educated, Mr. Ryding

has friends in every walk of life as was evidenced by the veritable flood of congratulatory messages he has been receiving ever since the announcement of his advancement.

That Mr. Ryding's policies will undoubtedly be in line with those of his immediate predecessor in office, was the gist of his initial statement. This message contained in addition warm expressions of love for and admiration of the force and employes of the Tennessee company.

Men of the Industry

FREDERICK A. MELMOTH, formerly in charge of the foundry of Thomas Firth & Sons, Sheffield, Eng., and internationally recognized as one of the leaders in the steel casting production field, has been appointed technical director of the Detroit Steel Casting Co., Detroit. He will not only have charge of methods for production of high quality castings but will also direct the development of special alloy steels and act in a consulting capacity in applying such steels to the needs of the company's customers. His early experience was gained at the Brown Bailey Steel Works of Sheffield, where he became assistant in research laboratories. After several years spent in the metallurgical study of steel, he was transferred to actual steel production and in 1914 and part of 1915 he had charge of the night turn of the open-hearth department, making various grades of steel, including the nickel-chromium series under the direction of and in association with Harry Brearley a pioneer in this metal. In 1916 Mr. Melmoth became associated with the National Steam Car Co., Chelmsford, Eng., where he remained for two years as foundry manager in charge of steel casting production. In 1918 he joined the staff of Lake & Elliot Co., Braintree, Essex, as steelmaker in the foundry and in 1920 was given full charge of the foundry. At that time he also served as consultant for the National Steel Foundry Co., Leven Fifeshire, Scotland. About four years ago he returned to Sheffield to take charge of the foundry of Thomas Firth & Sons.

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R. G. Fleming has been elected treasurer of Herman Z. Cutler Co. Inc., with headquarters at Camden, N. J., and plant at Bridgeton, N. J. David Lane has been made assistant general manager of the company.

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Joseph Gorthy has been appointed superintendent of the Pickands, Mather & Co. interests at Buffalo, to succeed the late Capt. W. E. Chilson. Since Captain Chilson's death several years ago, Mr. Gorthy has been acting superintendent.

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J. S. Wilde, pit foreman of the Wakefield Iron Co., Wakefield, Mich., for a number of years, will take up similar duties July 1 with the Inland Lime & Stone Co., Manistique, Mich. He will have direct charge of limestone pit operations.

FREDERICK A. MELMOTH

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Charles L. Harding, president, and Charles M. Holmes, treasurer of the Holmes Mfg. Co., New Bedford, Mass., resigned Feb. 11 at the annual meeting of stockholders. Daniel R. Wheedon of Boston was elected treasurer.

* * *

Guy E. Lown has resigned after having been identified with the Johnston Harvester Co., and its successor, the Massey-Harris Co., Batavia, N. Y., for more than 32 years. Since 1897 he has filled such positions as time clerk, stock clerk, cost clerk, purchase clerk, and paymaster in charge of time keeping, payroll and cost department. In 1907 he became purchasing agent and in 1925 he was elected a director and made treasurer. In August, 1928, when the company was consolidated with the J. I. Case Co., Racine, Wis., he was made assistant to the general manager.

* * *

George T. Aitken, formerly with American Tool Works, Cincinnati, and with many years' experience in the machine tool industry, has succeeded A. W. Hopkins as general sales manager of National Acme Co., Cleveland. Mr. Hopkins is now identified with the Allied Metal Products Co., Victor Peninsula division, Detroit.

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Carl G. Schluederberg, formerly general manager of the street lighting department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been placed in charge of the Cleveland plant with the title of works manager. His authority will also extend to the South Bend, Ind., and St. Louis plants, with headquarters in Cleveland.

* * *

George B. Shawn, associate director of the American Gas association testing laboratory at Cleveland, has been appointed chief engineer of the B-Line Boiler Co., Cleveland and Pittsburgh. Mr. Shawn formerly was with the United States bureau of standards as an engineer in gas research and appliance combustion development. He attended both Johns Hopkins university and George Washington university, completing his engineering studies at the latter institution.

* * *

David Pollock, Pottstown, Pa., was re-elected president of the Reading, Pa., chapter of the Institute of Scrap Iron and Steel Inc., Feb. 10. Other officers elected include: A. Sofransey, of H. Sofransey Co., Allentown, Pa., first vice president; Harry Weiner, of H. Weiner & Co., Pottsville, Pa., second vice president; Joel Claster, of Luria Bros. & Co., Reading, third vice president; Simon Michlovitz, of Michlovitz & Co., Harrisburg, Pa., fourth vice president; S. Jacobson, of Pear & Co., Reading, Pa., secretary; and

Julius H. Caplan, Lebanon, Pa., treasurer.

* * *

Frank C. Smith, for many years with the Worcester Pressed Steel Co., Worcester, Mass., has become associated with the Norton Co., Worcester.

* * *

O. C. Hendry, formerly of Oakland, Calif., has been placed in charge of the office recently established at Seattle by the Detroit Steel Products Co.

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W. A. Baldwin has been appointed Chicago representative of the unit-load sales department of the Acme Steel Co., Chicago.

* * *

Henry B. Rust, president, and John S. Brooks Jr., general counsel of the Koppers Co., Pittsburgh, have been elected directors of the United States Electric Power Co.

* * *

E. M. Robinson, assistant to F. S. Earnshaw, secretary-treasurer of the United States Stamping Co., Moundsville, Va., was recently appointed sales manager.

* * *

S. A. Harding, identified for many year with the Consolidated Machine Tool Corp., Rochester, N. Y., is now affiliated with the Brande Machinery Co., Cleveland, machinery dealer.

* * *

George P. Torrence, vice president and manager of the Link-Belt Co.'s plants in Indianapolis, recently was elected first vice president of the Associated Employers of Indianapolis.

* * *

Alden H. Baum, formerly assistant to the president, Mackintosh-Hemphill Co., Pittsburgh, has been appointed manager of oil refinery sales of the National Alloy Steel Co., Blawknox, Pa.,

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Dietrich Heyen has been appointed secretary and H. M. Heffernan purchasing agent of the Woodhaven Metal Stamping Co. Inc., 62 Schenectady avenue, Brooklyn, N. Y., manufacturer of specialties tools and dies.

* * *

E. J. Ashton has been appointed district manager for Aluminum Industries Inc., with headquarters at Chicago. For the past year he has been sales manager for the L. C. Smith Bearings & Parts Co.

* * *

Samuel C. Stannard, formerly manager of the Ingersoll-Rand Co. of Colorado, was recently appointed marketing manager of the steel division of the Colorado Fuel & Iron Co., with headquarters in Denver.

T. Aurelius continues as manager of the railroad department of the steel division and C. H. Murphy continues as sales manager of the general department of the steel division.

* * *

Harry Newcomer, Mt. Joy, Pa., was elected president of the Pennsylvania and Atlantic Hardware Seaboard association at the annual convention held in Atlantic City, N. J., Feb. 14. He succeeds Frank Hegner, of Sewickley, Pa.

* * *

William B. Lawson has resigned as director of sales of the International Nickel Co. of Canada Ltd. and from the boards of various owned and associated companies in the United States and Europe to become director and vice president of the Harshaw Chemical Co., Cleveland.

* * *

W. E. Corrigan, formerly in charge of the San Francisco office of the American Locomotive Co., has been appointed in charge of sales in the Pittsburgh district. He succeeds Otis R. Hale, who has been transferred to the Pacific coast in the former capacity of Mr. Corrigan.

* * *

George F. Bickford, formerly with the Jones & Lamson Machine Co., has become identified with the Hartford, Conn., sales office of Henry Prentiss & Co. Inc., 149 Broadway, New York, machine tools. He fills the vacancy caused by the recent death of J. H. Peckham.

* * *

E. J. Smith resigned as treasurer of the Stoughton Co., Stoughton, Wis., to become treasurer of the LaFayette Steel Products Inc., LaFayette, Ind. James R. Brown is temporarily acting as treasurer of the Stoughton company which operates gray iron and nonferrous foundries and manufactures motor truck body equipment.

* * *

Walter Harnischfeger, vice president of Harnischfeger Corp., Milwaukee, builder of cranes, etc., has sailed for Europe with Mrs. Harnischfeger on a combined business and pleasure tour. His father, Henry Harnischfeger, president of the company, expects to leave late in May for an extended visit to his birthplace in Germany.

* * *

Charles A. Haynes has been appointed manager of the transmission structures division, Truscon Steel Co., Youngstown, O. He received his education in mechanical engineering at London university, London, England, and as an industrial engineer, he has conducted investigations of manufacturing plants in the United States, England and Canada. He also has been engaged in industrial and electrical engineering in Africa and India. For five years past he has been connected in executive capacities with the Truscon company.

* * *

John M. Stewart has been appointed resident manager in the Pittsburgh district for Hickman, Williams & Co. Inc., with headquarters in the Oliver building Pittsburgh. He has been associated with the company at Pittsburgh for 20 years. Mr. Stewart succeeds L. Blaine Snow who a short time ago was named vice president of the company.

* * *

Paul Pleiss, foreign director of the Edward G. Budd Mfg. Co., Philadelphia and Detroit, sailed Feb. 1 for Berlin. For a month previous he had toured the United States, interviewing some of the important American customers of the Budd company's European plants. Otto Mueller, managing director of the Pressed Steel Co. of Great Britain, with which the Budd company is affiliated, sailed on the same ship. He had been visiting the Budd plant at Philadelphia.

* * *

L. C. Bullington, manager since 1928 of the Detroit office, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been appointed general sales supervisor of the company with headquarters at East Pittsburgh. He was born in New York and there obtained his early education. In 1889 he became identified with the Westinghouse-Church-Kerr organization, with which he was associated for 14 years. When in 1903 those organizations entered into a merger, he was transferred to the sales department of the Westinghouse Machine Co., with headquarters at Atlanta, Ga. Later he was transferred to Buffalo in a similar capacity. In 1918 he was appointed assistant to the power department manager at East Pittsburgh, where he remained until June, 1922, when he was promoted to be assistant manager in the power sales department. In 1925 he was made Cincinnati office manager and in 1928 was transferred to Detroit as office manager where he served until his recent appointment.

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C. W. Wolfe, assistant vice president in charge of foreign operations, and F. A. Coleman, foundry expert, both of the staff of the Austin Co., Cleveland, have sailed for Russia to supervise preliminary work on the $40,000,000 automobile plant and industrial city the company is designing and building for the Soviet government at Nizhni Novogorod. They are accompanied by their wives and will remain in Russia for two years. They will be met at Nizhni by F. W.

Crosby, chief architect for the foreign department, who will return to Celveland a week after their arrival. Mr. Wolfe will be in charge of operations until about April 1, when H. F. Miter, vice president of the company's foreign department, arrives with the main contingent of about 20 Austin engineers and technical experts. Mr. Wolfe and Mr. Coleman will supervise a force of Russian labor in assembling material preliminary to actual construction. Mr. Wolfe has been a member of the Austin organization since 1923, as superintendent of construction and later in the foreign department. Mr. Coleman, before joining the Austin organization, was head of the F. A. Coleman Co., manufacturer of industrial ovens.

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Randall Van Winkle has been made manager of the Wandtke Pattern & Foundry Co., Anderson, Ind. He has been connected with the office of the Anderson Foundry & Machine Works, Anderson, for several years.

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James W. Rawle, vice president, J. G. Brill Co., Philadelphia, was elected president of the Pennsylvania Manufacturers' association, to succeed Joseph R. Grundy, who resigned when he was appointed United States senator.

* * *

Horace W. Merriman has been appointed sales manager in the Philadelphia district for the Alan Wood Steel Co., with headquarters in the Widener building, Philadelphia. Mr. Merriman had been connected with the Philadelphia offices of Donner Steel Co. Inc., and Carnegie Steel Co.

H. H. Neel has been appointed assistant sales manager of the Alan Wood Steel Co. at Philadelphia.

Cambria Wins in Safety

Johnstown, Pa., Feb. 18.—The Cambria plant of the Bethlehem Steel Co. won the annual trophy for 1929 in the safety contest conducted by the company in ten districts. The Steelton plant was second. Cambria had 156 lost-time accidents in 1929, of which 12 involved permanent disability and eight were fatal.

Hoist Orders Are Fewer

New York, Feb. 18.—Orders for electric hoists in January declined 12.3 per cent from the December figure, according to compilations of the Electric Hoist Manufacturers' association. The value of these orders fell 18.298 per cent. On the other hand shipments for January increased 5.761 per cent over December.

Here and There

(*Concluded from Page* 90)

progress and a large number of its design have been installed in nonferrous melting plants and also in foundries. Ajax Electrothermic Corp. is a subsidiary, manufacturing induction-type electric furnaces for nonferrous and alloy steel melting.

* * *

BETHLEHEM STEEL CO. has greatly enlarged its offices in the American Bank building, Seattle, following acquisition of the Pacific Coast Steel Co.

* * *

CLEVELAND CO-OPERATIVE STOVE CO., Cleveland, has bought the Rayglo Corp., Athens, O., manufacturer of radiant gas heaters, and will move its equipment to the Cleveland plant. The plant was bought from receivers.

* * *

WICKWIRE-SPENCER STEEL CORP., Worcester, Mass., has abandoned its ornamental wire department, Clinton, Mass., which recently was moved from Worcester. The Wickwire company recently sold its wire goods department to the Washburn Co., Worcester.

* * *

BUCYRUS-ERIE CO., South Milwaukee, Wis., has booked an order for $1,250,000 worth of large revolving shovels for the Anglo-Chilean Nitrate Co. for use in mining nitrate in a new field in northern Chile. The order covers 24 shovels, each of four yards capacity. The Chilean company already has 23 similar units in operation, products of the Bucyrus-Erie company.

* * *

THOMAS PROSSER & SON, 15 Gold street, New York, American representatives of the Fried. Krupp A. G. Steel Works, Germany, and exclusive distributors in the United States of Widia tungsten carbide cutting tools, have opened a branch office at 7338 Woodward avenue, Detroit, and also have made arrangements for the manufacture and servicing of Widia cutting tools. The company has appointed as distributing agents for Widia metal the Lynd-Farquhar Co., 326 Congress street, Boston, and the Eccles & Davies Machinery Co. Inc., 316 South San Pedro street, Los Angeles.

* * *

UNITED DRY DOCKS INC., New York, is erecting two buildings, 60 x 513 feet, at Arlington, Staten Island, N. Y. The new plant is designed for mass production of riveted and welded steel construction, including high and low pressure tanks, steam boilers, smokestacks, breeching, structural steel, large pipe lines, dryers and rotary coils. Straight line methods will be installed with all handling by electric cranes, gravity, jib cranes and car pullers. Immediate or quick delivery is a feature of the new shop. Sales are in charge of Harry Lindemann, 11 Broadway, New York, the company's main office. James Clute Jr. is operations manager at the plant.

Expect Improvements at Tennessee Co.

Birmingham, Ala., Feb. 18.—Expectations that considerable development work will be authorized at the plants of the Tennessee Coal, Iron & Railroad Co. as a result of the inspection trip last week by important New York executives of United States Steel Corp. are entertained here. Myron C. Taylor, chairman of the finance committee of the Steel corporation; James A. Farrell, president, and Vice Presidents Kerr, Hulst and Hughes, with H. C. Ryding, new president of the Tennessee company, and George Gordon Crawford, retiring president, went over the various properties. The executives were tendered a dinner by leading industrial and financial men of the Birmingham district.

Buffalo-Michigan Rate Change Dropped

Buffalo, Feb. 18.—The proposed increase of freight rates between Buffalo and points in Michigan has been abandoned by the railroads, which sought to add as much as 9 cents a hundred pounds to some classes of freight. The increases, if adopted, would have put Buffalo at great disadvantage in steel sales compared with Pittsburgh, mill operators contended here.

By-Products Net Higher

Chicago, Feb. 18.—The report of the By-Products Coke Corp., now part of the Interlake Iron Corp., for the year ended Dec. 31, 1929, shows net profit of $2,002,639 after all charges, equal only $16.50, leaving the market quot-shares of capital stock. In the previous year the By-Products Coke Corp. reported net profit of $1,354,124, or $7.13 a share on 189,936 shares then outstanding. The report excludes recently acquired companies which began to operate as of Jan. 2, 1930.

European Steel Markets Quieter

More Mergers Reported—Organization of Syndicates Progressing in Belgium—British Iron and Steel Production Shows Increase

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, Feb. 18.—(*By Radio*)—Iron and steel markets in Great Britain and on the Continent are quiet, with some amalgamations proceeding in England and Germany, and organization of international selling syndicates progressing in Belgium. Wigan Coal & Iron Co., and Pearson & Knowles Coal & Iron Co., British iron and steel producers, are negotiating to merge their interests. Berlin reports the Otto Wolff and Gelsenkirckener steel interests have acquired a controlling interest in Vereinigte Stahlwerke.

Exports from the Middesbrough district are disappointingly small. Barrow works are benefiting from a number of railroad orders. Demand for Staffordshire best iron bars is active. Imports of continental billets and bars amounted to 2273 tons last week. Manufacturers of special steels in the Sheffield district report substantial sales for domestic and export shipment. The market for galvanized sheets is dull.

Production of pig iron in Great Britain in January amounted to 650,000 tons, compared with 643,000 tons in December and 631,400 tons in November. The number of active stacks Feb. 1 was 159, three less than on Jan. 1. January steel output totaled 771,100 tons, compared with 661,200 tons in December and 815,000 tons in the preceding month.

British iron and steel imports in January amounted to 310,316 tons, compared with 256,429 tons in December and 250,430 tons in November. Exports advanced to 351,846 tons from 331,977 tons in December. The November total was 382,699 tons.

Higher British Prices Deter Active Trading

BIRMINGHAM, Eng., Jan. 31.—The Central Pig Iron Producers association held a meeting at Birmingham yesterday and reaffirmed pig iron prices. It was generally expected this decision would be taken in view of the changed condition of the market compared with three months ago when prices were fixed. Since the year opened demand for pig iron has fallen off seriously and some Northamptonshire furnaces

Sterling $4.87

are not disposing of their output of foundry material. Furnace coke has eased although furnacemen evidently consider the fall is not sufficient to warrant a reduction in pig iron. No hint was given yesterday as to how long the present level will be maintained. It is generally felt in this district that there will be no revival of demand until pig iron is cheaper. The slump of the last few weeks has caused furnacemen misgivings as to wisdom of the recent advance.

The export trade in Middlesbrough district is almost at a standstill but shipments against contracts are heavier and the January return will be at least 5000 tons ahead of December. Consumers in the home trade are taking a similar line to that

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, February 17	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON	£ s d		£ s d		£ s d		£ s d	
Foundry No. 3, Silicon 2.50-3.00	$17.62	3 12 6*	$16.77	3 9 0	$16.77	3 9 0	$17.50	3 12 0
Basic-Bessemer	16.65	3 8 6†	15.80	3 5 0	15.80	3 5 0	16.77	3 9 0
Hematite, Phosphorus 0.02-0.05	18.96	3 18 0	24.63	630*	.....	.....	17.74	3 13 0
SEMIFINISHED STEEL								
Billets	$29.77	6 2 6	$22.36	4 12 0	$22.36	4 12 0	$22.36	4 12 0
Wire rods	41.31	8 10 0	30.38	6 5 0	30.38	6 5 0	30.38	6 5 0
FINISHED STEEL								
Standard rails	$40.10	8 5 0	$31.59	6 10 0	$31.59	6 10 0	$31.59	6 10 0
Merchant bars	1.74c	8 0 0	1.16c	5 5 0	1.16c	5 5 0	1.16c	5 5 0
Structural shapes	1.68c	7 15 0	1.09c	4 19 3	1.09c	4 19 3	1.10c	4 19 9
Plates, ship, bridge and tank	1.79c	8 5 0	1.36c	6 4 0	1.36c	6 4 0	1.40c	6 7 0
Sheets, black, 24 gage	2.17c	10 0 0	2.28c	10 7 6	2.28c	10 7 6	2.33c	10 12 0
Sheets, galvanized, 24 gage, corrugated	2.52c	11 12 6	2.79c	12 13 9	2.79c	12 13 9	2.97c	13 10 0
Bands and strips	2.17c	10 0 0	1.24c	5 12 6	1.24c	5 12 6	1.23c	5 12 0
Plain wire, base	2.06c	9 10 0	1.43c	6 10 0	1.43c	6 10 0	1.54c	7 0 0
Galvanized wire, base	3.04c	14 0 0	1.82c	8 5 0	1.82c	8 5 0	1.87c	8 10 0
Wire nails, base	2.39c	11 0 0	1.49c	6 15 0	1.49c	6 15 0	1.54c	7 0 0
Tin plate, base box 108 pounds	$ 4.56	0 18 9	.....	.....	.....	.....	$ 8.99	1 17 0
*Francs								
Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$17.62	3 12 6	$19.16	490(2)	$17.58	630	$20.29	85
Basic pig iron	16.65	3 8 6	20.53	525(1)	15.62	550	21.72	91
Furnace coke	4.25	0 17 6	6.57	168	6.28	225	5.13	21.50
Billets	29.77	6 2 6	24.24	620	24.83	890	28.88	121
Standard rails	1.79c	8 5 0	1.46c	810	1.63c	1,250	1.51c	140
Merchant bars	1.74c	8 0 0	1.25c	695	1.22c	940	1.53c	141
Shapes	1.84c	8 10 0	1.26c	700	1.21c	935	1.50c	138
Plates, ship, bridge and tank	1.95c	9 0 0	1.42c	790	1.46c	1,125	1.71c	158
Sheets, black, 24-gage	2.28c	10 10 0	2.65c	1,470	2.73c	2,100	2.43c	225
Sheets, galvanized 24 gage, corrugated	2.55c	11 15 0	3.55c	1,970	3.45c	2,650	3.78c	350
Plain wire	2.06c	9 10 0	1.94c	1,075	2.15c	1,650	2.43c	225
Bands and Strips	2.17c	10 0 0	1.44c	800	1.53c	1,175	1.77c	164

*Middlesbrough; †Basic-‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 17s 6d ($4.25) f. o. b. Ferromanganese £21 13s 0d ($105.22) delivered Atlantic seaboard, duty-paid. German ferromanganese £15 0s 0d ($72.90) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

adopted at Birmingham, namely abstention from buying in the hope of lower prices. There is an adequate supply of coke which has cheapened considerably within the past few weeks. Buyers are ordering pig iron on a hand-to-mouth basis but steelworks are sending in specifications sufficient to absorb nearly all the output from Middlesbrough furnaces. Ironmasters are able to maintain the fixed price of £3 12s 6d ($17.64) for No. 3 foundry.

The position in regard to east coast hematite has undergone a marked change. Some time ago output was increased by the relighting of a large modern furnace but since then demand has relaxed so that there is more iron than can be absorbed locally. Consumers are pressing for reductions which they are able to obtain sometimes from the merchants but manufacturers as a rule will not give way and they contend that the cost of production is so high that even at the present price hematite shows practically no profit. Nevertheless the fall in coke ngni as hope among consumers that hematite makers will shortly give way.

factor likely to have an important effect upon iron and steel selling prices is the coming advance of wages. Arthur Pugh, general secretary of the Iron & Steel Trades confederation, announced that agreement has been reached with employers for a general improvement in standard wages of lower paid workers in the heavy steel trade. The agreement, which it is stated will come into force in a few days, has been the subject of negotiation for a long period and will cover all the important steel work in England and Scotland outside Sheffield, where the members of the confederation received special consideration when the 1925 agreement was being negotiated and where special agreements are in operation. Increases ranging from 1s ($0.24) to 5s ($1.21) a week in the base rates have been secured.

An important step toward the rationalization of the steel trade in Scotland has been taken by two of the largest steel manufacturing firms in Britain, William Beardmore & Co. Ltd. and David Colville & Sons Ltd. As of Feb. 1 Colville's will take over completely Beardmore's business in plates, sections and rails and the Beardmore works at Parkhead, Glasgow, will be remodeled with a view to concentration upon production of heavy forgings, etc. While it is hoped that the ultimate effect will be to increase employment, one of the immediate results will be to throw out of work about 600 men at Parkhead. The agreement does not involve the amalgamation of the two companies, neither will there be any exchange of shares or fusion of capital interests. The transfer of the work to Colville's will provide full time employment for the firm's workers at Motherwell, Clyde Bridge and Glengarnoch, who are at present on short time.

Belgian Steel Trade Slack While Syndicates Are Being Formed

BRUSSELS, Jan. 31.—(*European Staff Service*)—The volume of business on the Belgian iron and steel market is small, and new orders are scarce. This falling off of activities is general all over the country, and numerous works have reduced their output. The Boel works closes down one day each week. Orders for hoops and for skelp are particularly small. Prices generally are not modified and are those fixed by the entente. Obviously, the whole market is expectant, owing to important negotiations which now are going on with regard to the international organization of production and sales.

A small technical committee met at Luxemburg Jan. 20 to discuss the organization of export markets, especially from the standpoint of relations between the international selling syndicates and export firms. These export firms are particularly numerous in Belgium, and they claim that the syndicates will not be able to do without them, owing to the large number of connections which these firms already have opened up in various markets, and the arrangements existing between them and their customers from the point of view of terms of payment. The problem to be solved is the organization of relations between the syndicates representing the works and these intermediaries, and the fixing of the percentage of commission which should be allowed to the latter. A commission of 1s (24c) per ton has been mentioned, but apparently this is not sufficient to cover the export firms, in view of the risks which they have to encounter, and also in view of the credit terms which they have to allow their clients. The export firms have asked for 2s (48c) per ton commission, and it is probable that the final figure will be found between the two. Apparently it also is proposed to designate one export firm for each particular works, and this firm would act as the representative of the works.

With regard to the tendency of the existing comptoirs, it appears to be in the direction of allocating export markets and allowing quotas to the export groups for each individual market. This procedure already has been adopted for the wire rod syndicate, and it probably will also be adopted for the foundry pig iron comptoir. In all the conversations which have been held up to now, the principle of reserving domestic markets has been followed, limited to the tonnage that was fixed in allocating production quotas at the formation of the comptoirs. With regard to the Belgian domestic market, the time is approaching when an entente will be reached between Belgian producers to fix domestic prices, probably the same as for exports.

German Steelmaker Has Larger Profit

Berlin, Jan. 31.—(*European Staff Service*)—The Vereinigte Stahlwerke, or United Steelworks Corp. of Germany, has issued the following figures relating to its activities during the last quarter of 1929, which constituted the first period of three months of the financial year 1929-30. The table gives these figures in comparison with those of the preceding quarter.

	Fourth quarter 1928-29 July-Sept. 1929	First quarter 1929-30 Oct.-Dec. 1929
Production	(Metric tons)	
Coal	7,413,940	7,350,730
Coke	2,709,629	2,657,190
Pig iron	1,680,436	1,657,442
Raw steel	1,695,920	1,705,526
Sales outside the corporation		
	(Marks)	
Domestic	256,000,934	217,259,412
Foreign	146,498,226	136,946,233
	402,499,160	354,205,645
Number of workers and staff employees	**Sept. 30, 1929**	**Dec. 31, 1929**
Workers	176,716	173,852
Staff employees	15,331	15,404

For the financial year ending Sept. 30, 1929, the gross profit of the Vereinigte Stahlwerke was 284,760,000 marks ($68,000,000), against 289,170,000 marks ($69,000,000) in the previous year. After providing for financial charges, taxation, welfare contributions and amortization funds, the net profit amounted to 52,710,000 marks ($12,500,000), 230,000 marks ($55,000) more than in the preceding year. The dividend was 6 per cent.

Germany Makes Record

Berlin, Jan. 31.—(*European Staff Service*)—The output of pig iron in Germany in 1929, was 1,100,378 metric tons, making a total for the year of 13,400,767 tons, against 11,804,330 tons in 1928, an increase of 12.5 per cent. The 1929 output was divided as follows: 8,424,866 tons of basic bessemer, 2,667,900 tons of ferro-alloys, 1,162,982 tons of foundry, 1,091,086 tons of hematite, 26,395 tons of direct castings, 16,101 tons of acid bessemer and 11,437 tons of gray forge pig iron. The highest monthly output of the year was attained in July with 1,203,510 metric tons, which constitutes the record figure for Germany since that country has been within its present boundaries. Comparison, in metric tons, follow:

Mon. ave.	Furnace on last day	Pig iron	Steel ingots and casting	Finished steel
†1913	.....	909,640	993,640	970,240
1926	*109	803,625	1,028,470	856,340
1927	*116	1,091,875	1,359,225	1,069,930
1928	*101	984,700	1,209,770	963,550
1929	95	1,116,730	1,353,820	940,425
1929				
Jan.	97	1,097,980	1,469,653	1,001,824
Feb.	96	981,695	1,269,874	864,801
March	97	1,061,214	1,314,373	904,257
April	99	1,105,098	1,414,916	978,473
May	104	1,133,134	1,421,047	959,090
June	103	1,164,358	1,430,452	985,884
July	103	1,203,510	1,466,072	1,029,588
Aug.	96	1,167,809	1,401,707	1,012,666
Sept.	100	1,108,925	1,230,796	906,049
Oct.	102	1,156,970	1,376,856	969,549
Nov.	100	1,090,968	1,286,357	867,802
Dec.	95	1,100,378	1,156,105	802,199
Total		13,400,767	16,245,921	11,285,080

†Present boundaries.
*Last day of year.

Dr. Thyssen Resigns as German Steel Head

Dr. Fritz Thyssen has resigned as chairman of the German raw steel association and of the Stahlwerksverband, and the vacancy probably will be filled by Dr. Ernst Poensgen, director-general of the Vereinigte Stahlwerke. The resignation of Fritz Thyssen, who maintains his position as chairman of the Vereinigte Stahlwerke, is much regretted in the German steel industry, since he is the man who always has favored and worked for the association movement. The establishment of the associations was mainly achieved through his initiative and activity, and now that they have been prolonged for a 10-year period he can relinquish his duties to others. He was born in 1873 in Mulheim-Ruhr and at 19 years of age he became a member of the board of the Hamborn coal mine. For three years he studied at the technical high schools of Charlottenburg, Liege, and London. He now is active in the leadership of the Vereinigte Stahlwerke and the Concordia Mining Co. He also is a prominent member of the board of many industrial undertakings, including the Gelsenkirchen Mining Co., Mitteldeutsche Stahlwerke, Charlottenhuette, Rhenish-Westphalian Electric Power Co., Rhenish-Westphalian Coal Syndicate.

As successor to his father, the late August Thyssen, he was the leading organizer of the Vereinigte Stahlwerke, of which the Thyssen combine holds 26 per cent. All his life he was busy in modernizing and reorgonizing the domestic and foreign organization of the Thyssen combine, and later of the Vereinigte Stahlwerke. In connection with which he undertook several journeys to the United States and to India. Thanks to American connections he acquired in and to the world-known name of the Thyssen group, the Thyssen combine was the first German industrial undertaking which could place a long term mortgage loan in America after the termination of the inflation period. By the Treaty of Versailles, Thyssen lost the modern plants of Hagondange in Lorraine, and to replace them, Fritz Thyssen extended and modernized the Hamborn plants, which today are the largest and most modern in Europe.

Reduces Pig Iron Rates

Albany, N. Y., Feb. 18.—Public service commission has appproved new reduced freight rates of the New York Central railroad, west, on carload lots of pig iron. Charges will apply on carload weights over 56,000 pounds, and will become effective March 3.

American Rolling Mill Has British Plant

Middletown, O., Feb. 18.—Charles R. Hook, president, American Rolling Mill Co., has announced the company has arranged with Messrs. John Summers & Sons Co. Ltd. to manage and operate as an American Rolling Mill unit, the specialty sheet division of the Summers company plant at Shotton, Chester, England.

John Summers & Son Co. Ltd. is said to be the largest producer of sheet steel outside of America and has been associated with American Rolling Mills Co. for some years through license agreements covering the manufacture of ingot iron and dating from before the war.

The specialty sheet division of the Shotton works now to be put under American Rolling Mill management was recently built, of modern design and laid out for rapid and convenient increase in capacity to whatever extent the growth in British demand for automobile and other high finish sheets may require.

The plant was designed and installed under a working arrangement between Messrs. Summers and the American Rolling Mill Co. It is now the intent to offer through this new unit, supported by the combined facilities of the two companies high finish sheets adequate in both quantity and quality to serve the growing automobile industry of Great Britain on a basis comparable to that existing in America.

This arrangement is a further development in the program American Rolling Mill has been following in Europe since 1913 for the purpose of co-operating with leading European iron and steel companies for the supply to the market of the special grades of iron and steel. In France, American Rolling Mill is associated with Cie de Forges de Neuves Maisons et Chatillon and others and in Germany the Armco-Eisen G. m. b. H. of Cologne, a subsidiary of the Armco International Corp., is operating under agreement with the United Steel Co. of Germany—the Vereinigte Stahlwerke, of Dusseldorf.

Operations in England under American Rolling Mill management will be initiated promptly as the working organization is leaving Middletown before March 1.

Completing New Ore, Coal Docks at Toledo

New and modernly-equipped coal and ore docks with a coal dumping capacity of 100 cars an hour are being constructed by the Hocking Valley railroad, at a cost of $8,000,000, to augment the present facilities for taking care of the Lake Erie trade. The new docks are being erected at Presque Isle, on Maumee bay, at the mouth of the Maumee river, Toledo, O. The site is approximately three miles nearer the lake than the present Hocking Valley docks, over which the Chesapeake & Ohio has been dumping its coal.

The plant will consist of two slips, with a depth of 23 feet and each slip will hold ten of the largest vessels now floating on the Great Lakes. The coal docks will be equipped with two Brownhoist electric car dumpers of the latest type, each dumper having a capacity for loading into the boats 50 cars, of any size, an hour, or a total of 100 cars per hour.

Announcement has also been made that the ore handling facilities will consist of three stiff-legged all electric Wellman - Seaver - Morgan machines, with a capacity for unloading from the vessel to cars 10,000 tons of ore in four hours. The new facilities for unloading ore will be ready for opening of navigation in 1930, and the new coal docks will be placed in operation by June 1, 1930. Advantages of the new docks are said to be, faster available service, docking and undocking vessels without the aid of tugs; elimination of six-mile river movement and consequent freedom from river hazards, draw-bridges and low water. With the acquisition of the Hocking Valley road, the Chesapeake & Ohio will now have its own docks on Lake Erie.

Trackwork Is Slack

Shipments of trackwork for tee rail of 60 pounds or over in January were 11,830 net tons, compared with 10,826 tons in December and 10,344 tons in January 1929. Total shipments for 1929 were 162,115 tons, compared with 139,645 tons in 1928 These totals are low compared with 211,622 tons in 1923 and 197,005 tons in 1926, according to the American Iron and Steel institute.

The first methods of testing ores were by fire assaying in the so-called dry way. There are not many references to such methods before the sixteenth century.

Obituaries

HARRY AINSWORTH, 67, president of Williams, White & Co., Moline, Ill., manufacturers of forging machinery, and connected with them for more than 40 years, died in the University hospital, Iowa City, Iowa, Feb. 6, from uremic poisoning. He was born in Geneseo, Ill., May 9, 1862, and with his family, moved in 1870 to Moline, where he attended school. He was graduated from Oberlin college in 1884 and then entered the law school at Harvard university, from which he was graduated in 1887. Although admitted to the bar shortly after his graduation, he did not practice but associated himself with the management of Williams, White & Co., of which his father was president. Harry Ainsworth started in at the bottom but by close application to business was promoted to various positions, being vice president and general manager during the last years of his father's life. In October, 1914, upon the death of his father, he became president, continuing as general manager. During the World war under his guidance, the company developed processes for the economical production of shells on machines built by them. About a year before the war ended Mr. Ainsworth organized Moline Forge Inc., and built a plant in Forty-third street, Moline. Two years ago he rebuilt the foundry of Williams White & Co.

* * *

William T. Bates, 52, traffic manager of the main works of the Northwest Engineering Works, Green Bay, Wis., died Feb. 8 of pneumonia.

* * *

Leslie E. Proper, 34, designing engineer for the Oxweld Acetylene Co., Newark, N. J., died at Elizabeth, N. J., Feb. 10, after a brief illness.

* * *

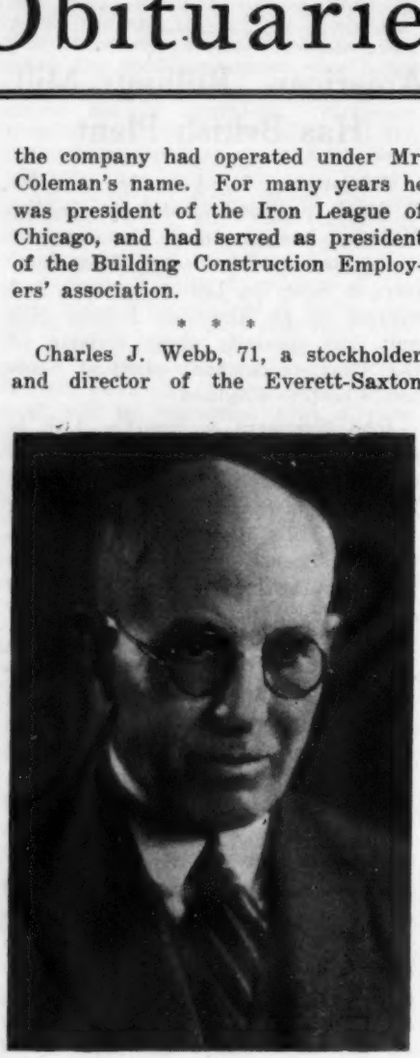
Horace G. Campbell, 60, president of the Reading Stove Works, Royersford, Pa., and founder of the Keystone Structural Co., now the Belmont Iron Works, Philadelphia, died Feb. 7 at Daytona Beach, Fla.

* * *

Adelbert E. Coleman, 71, manufacturer of ornamental iron and bronze, died Feb. 13 at Chicago. Mr. Coleman in 1893 founded the Chicago Ornamental Iron Co. For the past 15 years the company had operated under Mr. Coleman's name. For many years he was president of the Iron League of Chicago, and had served as president of the Building Construction Employers' association.

* * *

Charles J. Webb, 71, a stockholder and director of the Everett-Saxton



HARRY AINSWORTH

Co., with a blast furnace and large quarry and coal properties at Everett, Pa., died at his home in Philadelphia, Feb. 10, of a heart attack.

* * *

Albert W. Priest, 82, pioneer industrialist of Appleton, Wis., died Feb. 6. He was president of Hayton Pump & Blower Co., Eagle Mfg. Co., Appleton, and Green Bay Wire Works, Green Bay, Wis. He also was a director of the Four Wheel Drive Auto Co., Clintonville, Wis.

* * *

Harry L. Tanner, 47, president of Tanner Engineering Co., New York, was killed Feb. 11 in an automobile accident at Brooklyn, Mr. Tanner, a native of Cortland, N. Y., and a graduate of the University of Michigan, also consulting engineer for the Ford Instrument Co. He was formerly chief engineer for the Sperry Gyroscope Co. and had also been connected with General Electric Co. and Niagara Falls Power Co. Mr. Tanner was the holder of more than 100 patents involving electrical apparatus.

* * *

John Henry Longmaid, 69, president, Esterbrook Steel Pen Mfg. Co., Camden, N. J., died at his home in Bryn Mawr, Pa., Feb. 17.

Minnesota Ore Has High Manganese Content

Using Minnesota manganiferous iron ore, the north central experiment station of the bureau of mines, cooperating with the University of Minnesota, Minneapolis, has produced a slag which can be used in making ferromanganese in the blast furnace or electric furnace. In experiments employing a 6-ton basic open hearth, it was possible to produce a slag containing 50 to 70 per cent manganese oxide, 5 to 10 per cent ferrous oxide, and less than 0.2 per cent phosphorous. The Minnesota manganiferous iron ore occurs in large deposits, is easily mined, and is accessible from the Great Lakes.

The problem is essentially one of separating the iron, phosphorus, and manganese in ores which contain from 8 to 10 per cent manganese, about 45 per cent iron, and 0.2 to 0.3 per cent phosphorus. This separation is made by treating high-phosphorus spiegel in a basic open hearth and is possible because ferrous oxide and phosphorus compounds are reduced much more readily than manganese oxide. A reducing atmosphere is provided by adding coke breeze to the slag bath after the manganese and part of the phosphorus have entered the slag as a result of iron ore additions. Average results of 193 open-hearth heats show that 86.32 per cent of the manganese in the spiegel was recovered in the slag and 9.81 per cent in the metal, leaving 3.8 per cent unaccounted for.

Otis Elevator Co., New York, has booked an order for 66 elevators, costing $2,900,000, from Starrett Bros. Inc., for the new Empire State building, New York. This is claimed to be the largest elevator contract in the history of the building industry.

Sivyer, Nugent in Steel Castings Merger

Directors of the Sivyer Steel Casting Co., Milwaukee, and the Nugent Steel Casting Co., Chicago, important electric steel foundries, have announced the consolidation of their companies. The combined organizations will function under the name of the Sivyer Steel Casting Co., with the home office located in Milwaukee.

Both have been active in the research and pioneering of new alloy steel castings to meet special conditions. By combining, the managements expect to provide more flexible facilities for handling of their important alloy tonnages. The new company will have production capacity of 1400 tons monthly of small and variable section castings in both high carbon and alloy steels. With the two-plant setup, castings can be segregated by type to provide more routine foundry practice, and production can be stabilized. The Sivyer company has two electric furaces of 1 to 3 tons capacity, while the Nugent company's equipment includes two electric furnaces of 1 to 4 tons capacity.

Lamar S. Peregoy, formerly vice president of the Sivyer company, becomes president, and C. R. Messinger, former president, becomes chairman of the board. On Feb. 14 the Sivyer company made a public offering of 20,000 no par shares at a price of $34 a share, coincident with the acquisition of the Nugent company.

Ontario Plans To Double Iron Ore Bounty

Toronto, Ont., Feb. 18.—The Ontario government has introduced in the legislature a bill increasing the bounty on iron ore from one-half cent to 1 cent per iron unit for each ton of ore mined. It is hoped this will develop the ore resources in the Lake Superior district near Michipicoten harbor and about 25 miles from Port Arthur. Difficulties presented by the low-grade character of the ore are reported to have been overcome by the development at Sault Ste. Marie of a new method for reducing them in an electric furnace.

Sheffield Profits Rise

Net earnings of the Sheffield Steel Corp., Kansas City, Mo., for the year ended Dec. 31, 1929, amounted to $1,216,880, equal after preferred dividends to $5.62 a share on 185,227 shares of common stock outstanding. This compares with net of $1,094,980 or $5.30 a share on 178,000 shares of common stock in the previous year. Directors and officers of the company were re-elected. William L. Allen is president; R. L. Gray, vice president; L. L. Middleton, secretary, and H. R. Warren, treasurer.

White Metal Institute Is Organized

New York, Feb. 18.—The Institute of White Metals was organized at a meeting of custom smelters and manufacturers of white metals at the Astor hotel recently. Smelters and manufacturers from Chicago, Indianapolis, New York, Boston, Buffalo, Newark, Philadelphia, Pittsburgh, Norfolk and Toronto, Ont., were represented. L. Muscat, United American Metals Corp., Brooklyn, N. Y., was elected temporary chairman, with Walter Schoenbach, American Lead Co., Indianapolis, temporary secretary, and Jerry Katz, American Metal Co., New York, temporary treasurer. A meeting of smelters and manufacturers of white metals in the middle west is to be called in Chicago, March 7. Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel Inc., outlined a program of activities to the meeting.

Superior Steel Reports Rise In Earnings

Earnings of the Superior Steel Corp., Pittsburgh, manufacturer of hot and cold-rolled strip steel, increased 148 per cent in 1929, according to a statement just issued. Consolidated net income for the year was $72,919. After charges, this is equal to 63 cents a share on 115,000 capital shares outstanding. Net for the preceding year was $29,353, equal to 29 cents a share on 100,000 shares of stock outstanding.

Link-Belt Income Higher

The Link-Belt Co., Chicago, reports net income for 1929, after all charges, of $3,484,686 compared with $3,241,823 for 1928. Net income applicable to the 709,117 shares of common stock amounted to $4.54 a share, compared with $4.21 a share in 1928. Sales for the year ended Dec. 31, 1929, amounted to $26,519,339, an increase of $3,281,130, or 14.11 per cent compared with the 1928 total. President Charles Piez, in presenting the report, said the company's business showed marked improvement in January of this year, especially on the Pacific coast.

Borg-Warner Buys Mill at Chicago

Chicago, Feb. 18.—Borg-Warner Corp., through its subsidiary, Galesburg Coulter-Disc Co., announces acquisition of the assets of Chicago Rolling Mills Inc., located in West Pullman, Ill. Preferred stock of the Borg-Warner corporation and an additional cash consideration are to be paid for the property, which comprises 17 acres of land, a group of buildings including forge shops and a modern power plant, as well as switch tracks and sidings for expansion.

The acquisition gives Galesburg Coulter-Disc Co. a plant in the steel district at the south end of Lake Michigan, in addition to its present manufacturing plant at Galesburg, Ill., and its steel and rolling mill at Newcastle, Ind., R. C. Ingersoll, president, explained. The new property will be equipped to produce special steel and fabricated parts for the farm implement, tractor, truck and automotive industries, and for other purposes. S. L. Ingersoll will manage this unit.

Metal Men in New York Start Credit Body

New York, Feb. 18.—Manufacturers and dealers in the metal industries doing business in the New York metropolitan district have organized the Steel Trade Credit Association Inc., with offices at 60 East Forty-second street. William Adams, of Joseph T. Ryerson & Son, has been elected president. The work of the association will be conducted under the guidance of Daniel A. Daly, who has had long experience in sales and credit management in connection with the metal trade in New York. Mr. Daly has been appointed general manager and treasurer. A committee made up of some of the leading credit executives in New York metal circles has been appointed.

May Build Town at New National Site

Chicago, Feb. 18.—Roscoe E. Williams & Co., Hammond, Ind., real estate firm, plans to construct an industrial city at a site nine miles east of Gary, Ind., to adjoin the recently acquired 1100-acre tract of the National Steel Corp., and serve the large steel producing plants the latter company is planning to erect. The community is to be known as Port Williams, Ind.

Bearing Company Soon To Be in Production

Massillon, O., Feb. 18.—Headquarters of the new Tyson Roller Bearing Co. have been located here, following the recent purchase of the local plant of the Byers Machine Co., at Oberlin road and Sixth street. Operations in this location will begin immediately after moving the temporary manufacturing headquarters of the Tyson company from the Reliance Mfg. Co. plant building.

Charles E. Stuart, former president of Central Alloy Steel Corp., is president of the Tyson Roller Bearing Co., and it was through his efforts, aided by the Massillon chamber of commerce and the recently instituted industrial commission, that the new industry was induced to establish here. Frank Tyson, inventor of the new type bearing that is to be manufactured, will be one of the executives of the company that bears his name. It is expected that the product of the new company will be placed upon the market within three to four months, as production should be in full swing by that time.

Temporary office quarters have been maintained in the Ohio Merchant's Trust building, but permanent space is to be provided at the recently secured plant building. The plant has 54,000 square feet of floor space in the main unit, with adjoining pattern storage shed, bar room, forge shop, steel storage shed, casting room and general storing unit, all in addition to an office building.

The Tyson company will prepare the plant for operating immediately. All power and electrical machinery in the plant at acquisition will be taken over. Machinery will be installed at once, and the plant altered. A group of industrialists and capitalists in New York have helped provide financial backing.

Postpone Mileage Scale Rates To March 20

Washington, Feb. 18.—The interstate commerce commission Feb. 12 issued an order postponing the effective date of part 6, docket No. 17,000, in which a mileage scale for iron and steel freight rates east of the Mississippi and north of the Ohio and Potomac rivers was prescribed, from March 20 to May 20.

Originally the mileage scale was decreed by the commission to be effective Sept. 20, 1929, but it has since been postponed twice. Carriers declared that tariffs could not be adequately prepared by the earlier date.

The postponement by the commission relates to all iron and steel articles mentioned in the original recommendation except cast iron annealing pots, rates on which become effective on 15 days' notice after March 20.

Further Drop of Stoker Sales in January

Washington, Feb. 18.—January sales of mechanical stokers touched a low for the past 13 months when a total of only 54 was sold. This is a considerable decrease from December, 1929, according to department of commerce figures. Comparisons follow:

1929	Stokers sold	Fire tube boilers	Water tube boilers
January	97	36	61
February	80	26	54
March	117	42	75
April	141	41	100
May	174	64	110
June	203	82	121
July	186	88	98
August	199	94	105
September	155	71	84
October	178	89	89
November	107	43	64
December	79	30	49
Total (year)	1,716	706	1,010
1930			
January	54	24	30

Tire Standard Effective

Washington, Feb. 18.—The simplified practice recommendation on industrial trucks tires, distributed last June, has been accorded sufficient acceptances to make it effective.

The division of simplified practice, department of commerce, is distributing its recommendation on pocket knives, which was effective as of Jan. 1, 1930.

Expels for Overbilling

New York, Feb. 18.—The executive committee of the Institute of Scrap Iron and Steel Inc. has expelled a member for "acts prejudicial to the best interests of the institute." Overbilling of shipments, in violation of rule 9 of the scrap code of ethics, was charged. The trade relations committee recommended that the executive committee expel the member, which was done.

Repair Victoria Furnace

Canadian Furnace Co. Ltd., Port Colborne, Ont., banked its Victoria furnace Feb. 11, for a six-week period in order to make blowing engine repairs and revamp the stockhouse bin arrangement.

Cites Six Major Factors in Mergers

Six major factors to be considered by the participants in any merger movement, and other questions which may or may not be important depending on the particular case, are analyzed in a 32-page booklet issued by Ernst & Ernst, public accountants. The booklet is a reprint of a paper presented by A. D. Berning, a partner of the firm, at a recent convention of the American Management association in Detroit.

"There are certain basic questions that apply to all business consolidations," the booklet says, "and the more important factors to consider in any merger movement are: (1) economic and legal soundness, (2) management, (3) financial position, (4) earning power, (5) formula or plan of merger, (6) launching the merged business."

January Shows Drop in Foundry Equipment

Cleveland, Feb. 18.—Foundry Equipment Manufacturers' association announces that for January, 1930, reports from 20 member firms indicate a sharp drop in the index of gross orders for foundry equipment. January shipments at 223.6 exceeded December, 1929, shipments of 201.9, but three-month average of gross orders revealed a decline. Monthly figures follow:

	1927	1928	1929	1930
Jan.	180.4	132.7	180.5	160.1
Feb.	198.0	123.6	197.0	.....
Mar.	131.1	138.6	209.4	.....
Apr.	130.1	107.7	172.6	.....
May	134.8	325.6	177.7	.....
June	138.4	149.1	177.3	.....
July	89.9	94.8	218.6	.....
Aug.	106.4	278.0	229.5	.....
Sept.	80.4	170.0	216.3	.....
Oct	98.0	185.0	245.3	.....
Nov.	95.8	197.8	128.6	.....
Dec.	106.8	166.5	208.0	.....

Base: Average monthly shipments for 1922-23-24 taken as 100.

Tennessee Company To Use Natural Gas

Tennessee Coal, Iron & Railroad Co. has contracted with the Southern Natural Gas Co. for natural gas to be piped from Louisiana fields to its plants at Bessemer, Fairfield and Ensley, Ala., replacing producer gas, fuel oil and other forms of fuel. The contract covers 4,500,000 cubic feet annually, with production for larger volume as needed. The pipe line has been completed from the oil fields in northeastern Louisiana to Atlanta, Ga., giving supplies to various cities enroute. Delivery of gas is expected to be started in March.

CONSTRUCTION *and* ENTERPRISE

Concise Timely Business Building Opportunities from Field of Industry

North Atlantic

BETHEL, CONN.—Danbury & Bethel Gas & Electric Light Co., Danbury, Conn., is rebuilding a 1-story coke screening plant. Cost will be about $40,000.

HARTFORD, CONN.—Superior Spring & Mfg. Co. Inc., 373 Washington street, closed bids Feb. 15 for the construction of a 2-story plant addition. Former bids were rejected. (Noted Sept. 12.)

NEW BRITAIN, CONN.—School department has appropriated a sum for the equipping of a foundry department for the New Britain trade school.

NEW HAVEN, CONN.—United Illuminating Co., 84 Temple street, is preparing plans for addition to power station on English street.

NEW HAVEN, CONN.—New Haven Gas Light Co., 80 Crown street, has awarded contract for the construction of a 1-story machine and repair shop on Chapel street, to Dwight Building Co., 67 Church street.

BALTIMORE—Anchor Post Fence Co., Eastern avenue and Kane street, was recently damaged by fire.

BOSTON—School department at Milton, Mass., near here, plans a 2-story school including manual training unit on Eliot street. Architects are Shepard & Stearns, 65 Franklin street, Boston.

BOSTON—Hospital department, care J. J. Dowling, 819 Harrison avenue, will soon award contracts for addition to and alteration of power plant at Tuberculosis hospital on River street, Mattapan, Mass., suburb of this city. J. H. Ritchie Co., 100 Arlington street, Boston, is engineer.

SAUNDERSVILLE, MASS.—Worcester Suburban Electric Co., care R. H. Alton, manager, Uxbridge, Mass., will erect substation here and also at Millbury and Douglass, Mass.

WEST SPRINGFIELD, MASS.—New England Smelting Works Inc., whose plant was recently damaged by fire, advises that reconstruction has been placed with E. J. Pinney Inc., contractor, Springfield, Mass. Building will be 125 x 130 feet and equipment for refining and smelting white metals will be installed. (Noted Feb. 13.)

CAMDEN, N. J.—S. Langston Co., Sixth street and Jefferson avenue, manufacturer of paper making machinery, has plans for a 2-story plant. Lackey & Hettel, 544 Federal street, are architects.

NORTH BERGEN, N. J.—Theurer Wagon Works Inc., 601 West Fifty-sixth street, New York, has plans for a 3-story plant here on Hudson boulevard.

NORTH HACKENSACK, N. J.—Hackensack Water Co., Main street, will receive bids about Feb. 26 through C. V. R. Bogert, architect, 210 Main street, for a 1-story workshop at Hackensack avenue and Temple street.

AMSTERDAM, N. Y.—Mohawk Carpet Mills Inc. is having preliminary plans drawn for a 2-story boiler house to cost $125,000. W. Becker, Elm street, is architect.

BROOKLYN, N. Y.—Brooklyn Standard Union, publisher, 1185 Rogers avenue, has plans for altering and building to type foundry. Cost will be about $150,000. Lockwood Greene & Co. Inc., 1 Pershing Square, are engineers.

NEW YORK—New York Central railroad, F. B. Freeman chief engineer, 466 Lexington avenue, plans a 3-story power house at railroad and Palisade avenue.

BIRDSBORO, PA.—Birdsboro Steel Foundry & Machine Co., care M. E. Post, plans a 1-story plant to cost approximately $30,000. Owner is receiving bids on general contract.

BRADDOCK, PA.—Sterling Steel Foundry, Eighth street at Pittsburgh & Lake Erie railroad, recently suffered a small fire loss in the pattern shop.

ERIE, PA.—City will receive bids until Feb. 25 for construction of the West Filtration plant that is estimated to cost about $750,000.

PHILADELPHIA — Belmont Iron Works, Washington avenue and Twenty-second street, will build a 1-story building to cost $15,000, at Eighteenth street and Westmoreland avenue.

PHILADELPHIA—Jacquard Knitting Machine Co., 1924 Hunting Park avenue, recently closed bids for a plant, office and machine shop building, 75 x 216 feet, at Ridge and Huntington avenues.

PITTSBURGH—Allegheny Steel Co., Oliver building, has an appropriation for plant improvement of $500,000, although sum will be applied to alteration of existing facilities, no construction of new buildings being contemplated.

TARENTUM, PA.—Tarentum Steel Corp., First National bank, will take bids March 1 for new steel mill, warehouse and equipment. L. F. Galbraith is structural engineer in charge. (Noted Feb. 6)

VERONA, PA.—Duquesne Light Co., 436 Sixth avenue, Pittsburgh, plans a power substation here. Byllesby Engineering & Management Corp., at the above address, are engineers.

WEST NEWTON, PA.—West Newton Foundry Co., a new organization making gray iron castings, will locate plant in south end of town.

PROVIDENCE, R. I.—Eastern Mfg. Co., maker of mechanical pencils, 409 Pine street, has awarded contract for a 1-story plant on Reynolds street to Bowerman Bros., 70 Bath street.

East Central

BLUE ISLAND, ILL.—A. Mosel, 2300 West Olive street, contemplates building a wire manufacturing shop to cost about $15,000. Location will be on 139th street.

CHICAGO—Foote Bros. Gear & Machine Co., 111 North Canal street, is planning the construction of a new plant.

CHICAGO—Dickson Co., manufacturer of thermostatic devices, 310 South Michigan avenue, has purchased a 2-story plant and office building at 7418 Woodlawn avenue from Drumm Construction Co., and equipment may be needed.

(*Continued on Page* 103)

Machinery

Further Inquiry from Railroads Appears—Buying Slow to Improve—Heavy Machinery Builders Have Backlogs of Good Size

RAILROAD inquiry is quickening, New York Central issuing a list of 10 tools while the Santa Fe and Chicago & North Western also are planning purchases. Railroad equipment shops and shipbuilders are becoming more active but the market still is slow to register any marked improvement. Considerable delay is experienced in the award of even definitely approved expenditures. American Austin Car Co., Butler, Pa., has awarded several tools for its new plant, both new and used equipment being included. A few radio and accessory manufacturers have appeared to purchase machinery for the first time in several months. Backlogs of heavy machinery builders in the Pittsburgh district are of sufficient volume to insure full operations until July, a report states.

New York, Feb. 8.—New York Central railroad is in the market for about 10 tools, including lathes and drills. The equipment is for several shops. Pending business for railroads in the East is heavier than for some time. A scattered list is also up for school equipment. Demand in general shows little change, some dealers reporting a slight increase outside the immediate New York district. A fair volume has been figured, but buyers in many instances are shopping around and are slow to close. The market continues spotty. Demand for grinding machinery improves gradually. Bearing and machine motor producers are operating at unchanged schedules.

Delivery on standard tools differs as to the builder, some being in position to make normal delivery on standard equipment, while others are still lagging. Boring machinery cannot be promised before three months by one eastern builder. Railroad equipment shops are inquiring for more tools as are shipbuilders. United Dry Dock Inc., is building a new tank and structural fabricating shop which will take presses, punches and drills. New business for overhead electric crane equipment is not heavy for this period and is falling behind last year. Locomotive crane buying is also slow.

Worcester, Mass., Feb. 18.—There is no definite tone to the machinery market. Most lines report slight and widespread demand and general spottiness. Grinders maintain an even balance and the small tool field is running along without special emphasis. The general opinion is that until business as a whole shows greater tendency toward aggressiveness some apathy will exist in the machinery market.

Pittsburgh, Feb. 18.—Machine tool awards are slightly heavier but although some dealers report good seasonal activity hesitancy is noted occasionally in closing on pending work and delays are encountered in formal awarding of approved expenditures. Recent orders continue to involve small individual purchases with the exception of heavier awards by Westinghouse Electric & Mfg. Co. American Austin Car Co. has closed on several new tools for its new Butler, Pa., plant, and some used equipment also has been purchased. Inquiry remains at a fairly active rate and pending work totals high. Backlogs of heavy equipment builders continue heavy, indicating full operations during at least the first half of the year. Illinois Steel Co. has awarded a continuous four-high plate mill to United Engineering & Foundry Co. Prospective work in heavy machinery includes a blooming mill, plate mill and sheet mill for Gulf States Steel Co., Birmingham, Ala.

Chicago, Feb. 18.—February sales of machine tools in this territory are making moderate gains over January, but this month's billings will be extremely light owing to the small carryover from January. Two or three road building machinery manufacturers have just completed some important purchases, and several radio and accessory manufacturers are in the market for the first time in many weeks. Inquiries are more numerous and are widely scattered among general manufacturing lines and jobbing machine shops. Santa Fe, in addition to previous inquiries, is asking bids on a 100-ton bushing press, and Chicago & North Western railroad will buy a large face grinder. The equipment to be purchased for the new Lane Technical High school, Chicago, will be in important volume. General improvement is noted in the market, but the pickup has been gradual.

Cleveland, Feb. 18.—Encouraging reports emanate from dealers here, reflecting a slow but steady increase in machinery buying. For the first time in many months purchases are coming in from the automotive field, not in any great number, but still a noticeable improvement over previous weeks. American Austin Car Co., with plant at Butler, Pa., and offices at Detroit, is planning to have new equipment installed at its plant by the first of March, production being planned soon thereafter. Four or five dealers here are quoting on the list of Chandler Products Corp., announced last week. This list is said to include some lathes and other tools for second operation work, in addition to screw machines of all types. A group of Russian engineers is visiting the plant of a local builder of turret lathes with a view to making extensive purchases.

Iron ore was discovered in a number of places in North Carolina in 1585 by an expedition sent out by Sir Walter Raleigh.

Slump in Crane Orders

New York, Feb. 18.—New crane orders and shipments declined in January, according to the Electric Overhead Crane institute. Volume fell not only below the December total, but reversed the trend of last year when overhead electric crane equipment volume started an upward trend which carried through most of the remaining months of the year.

Shipments the opening month of 1930 totaled 104 units with a tonnage capacity of 1257, valued at $977,078.89. This compares with 148 units, tonnage capacity 2192, valued at $1,380,321.45 in December. Shipments in January, 1929, were 107.

New orders fell off sharply to 56 units compared with 81 in December and 173 in January last year. Those 56 units had a tonnage capacity of 643, valued at $405,707.36, against a tonnage capacity of 1349 and value of $734,237.89 in December.

Unfilled orders on Feb. 1 totaled 303 units with a tonnage capacity of 6255¾, valued at $3.765,152.54. Unfilled orders Jan. 1 were 365 units, tonnage capacity 6772¼, valued at $4,429,369.07. On Feb. 1, 1929, unfilled orders were also 303 with a tonnage capacity of 4142¼, valued at $2,547,166.50, indicating that overhead equipment now on order is of a heavier type than that of one year ago.

Will Stock Roller Chain

Pursuant to the simplification program recently recommended and carried out by the department of commerce, the Link-Belt Co., Chicago, has inaugurated a plan for carrying complete roller chain drives in stock at various distribution points throughout the country. The plan, it is felt, will benefit both the maker and user in that it simplifies distribution and reduces losses formerly incurred by users in paying premiums of time and money for special goods shipped from distant points. Silent chain drives have been stocked by the company distributors for six years; the latest extension of the service is applied to roller chain drives, each consisting of two drive wheels and the chain.

Construction and Enterprise

(*Continued from page* 101)

ANDERSON, IND.—Phillip Cook & Sons, 174 Jackson street, die and tool makers, contemplate a plant addition.

FORT WAYNE, IND.—City Carriage Works Co., 629 South Barr street, has awarded contract for auto repair and top manufacturing plant at 514 East Wayne street.

HAMMOND, IND.—Beatty Machine & Mfg. Co. is receiving bids for plant construction here on 150th street.

TELL CITY, IND.—Local power plant of Ohio River Power Co. was recently damaged by an explosion.

DETROIT—Lincoln Park Tool Corp., 1525 Chandler street, Lincoln Park, machinists and tool makers, are reported in the market for machine tools, to include shaper and grinder.

DETROIT—MacDonald Bros. Engineering Co. Inc., 131 State street, Boston, expects bids to be ready in April, upon completion of present plans, for a laboratory building to be erected at Oakman and LaSalle boulevards here.

DETROIT—Kelsey-Hayes Wheel Co., 3600 Artillery street, has awarded contract for additions and improvements to press plant to J. A. Utley, contractor, 729 Penobscot building, and some contracts have been let.

DETROIT—Federal Steel Corp., 126 South Artillery street, will build new addition to be 42 x 156 feet which will be equipped with the latest type vats for pickling sheet and strip steel. Overhead cranes will also be installed. (Noted Jan. 23.)

DETROIT—One hundred and seventh airplane squadron, Michigan National guard, is having plans drawn by Giffels & Vallet, structural engineers, 604 Marquette building, for a hangar to cost $100,000 to be located at Wayne county airport, Middlebelt and Goddard roads.

MUSKEGON, MICH.—Accuralite Co., maker of piston rings, contemplates a 1-story plant addition for either spring or summer. A. W. Lines is president.

OWOSSO, MICH.—Ann Arbor railroad, care Victor Parvin, general manager, recently opened bids for the reconstruction of coach repair shops that were damaged by fire. The new main building will be 66 x 300 feet. (Noted Jan. 9.)

ST. JOSEPH, MICH.—Nortstrom Electric Co., 505 Pleasant street, which was recently incorporated, advises that it contemplates erecting own plant here some time in the future.

CHILLICOTHE, O.—Board of education, L. M. Hess clerk, will receive bids about March 1 for a 2-story high school to cost about $500,000 at Vine and Arch streets. Manual training and general science units will be included.

CINCINNATI—Edwards Mfg. Co., 531 East Fifth street, maker of sheet metal and building materials, has been granted a permit for plant alterations.

CINCINNATI—Aluminum Industries Inc., 2438 Beekman street, has awarded contracts for mold foundry and machine shop buildings, to cost about $100,000. Ray T. Mesker is secretary.

CLEVELAND—Chain Products Co., 3924 Cooper avenue, plans a plant addition to cost about $40,000. F. G. Hodell is president. Carter Richards Co., Engineers building, is architect.

CLEVELAND—Ohio Chemical & Mfg. Co., 1177 Marquette avenue, has awarded contract for a 1-story plant addition to A. M. Higley, 2036 East Twenty-second street.

CLEVELAND—Union Steel Products Co., 15000 Athens avenue, manufacturer of steel roofing, is negotiating for the lease of 30,000 square feet of ground space at Jennings road and Dennison avenue on which to erect a new plant.

CLEVELAND—Westinghouse Electric & Mfg. Co., 1216 West Fifty-eighth street, will undertake an expansion program. The present foundry unit will be removed to another locality, and other plant facilities will be altered and improved.

COLUMBUS, O.—Buckeye Steel Castings Co., South Parsons avenue, will spend approximately $120,000 during the year for alterations to foundry building, installations of sprinkling equipment and building of crane operating space.

COLUMBUS, O.—Golden Eagle Aircraft Co., R. O. Bone president, Ingelwood, Calif., will move here and take over the municipal airport hangar temporarily. After alterations are made, production of airplanes will be started. A manufacturing plant to be erected adjacent to the airport and railroad facilities is in prospect for next fall.

DAYTON, O.—Dayton Electrotype Co., 316 West Fifth street, has been granted a permit for the construction of a workshop to cost $32,000, contract for which has been let to Henry Stock & Sons, 61 Brandt street.

HAMILTON, O.—Charles E. Koehler, Gray and Emerson streets, has been granted a permit for addition to foundry at 706 South Eighth street.

LIMA, O.—Buckeye Machine Co., O'Connor avenue and B. & O. railroad, plans additional space and equipment for the manufacture of diesel engine units. E. L. Neiswander is president.

LONDON, O.—State of Ohio, department of welfare, H. Griswold, director, Columbus, O., will receive bids for material and machinery about March 1, for the construction of a 3-story, 49 x 225-foot, addition to state-owned canning plant here.

OXFORD, O.—Miami university, care Mr. Roudebush, manager, has plans for a chemistry building to cost about $125,000. Garber & Woodward, 4 West Seventh street, are architects.

PHILO, O.—Ohio Ferroalloy Corp., Witters building, Canton, O., is planning to erect a 1-story, 80 x 250-foot plant, here. Cost is unstated.

YOUNGSTOWN, O.—Youngstown Sheet & Tube Co. plans an addition to sheet mill at its Brier Hill works to cost approximately $10,000,000.

LOGAN, W. VA.—Guyan Machine Shops Inc. needs machine tools, motors and other equipment including welders, hoists, punch and shear machine.

FOND DU LAC, WIS.—Common council has engaged Alvord, Burdick & Howson, hydraulic engineers, 8 South Dearborn street, Chicago, to make a survey and prepare estimates for proposed developments in municipal water works system.

JANESVILLE, WIS.—Bicknell Mfg. & Supply Co., manufacturer of tools and hardware, had plant recently damaged by fire. Loss is estimated to be at about $50,000.

MILWAUKEE—Anton Dohmen, architect, 542 Cramer street, is preparing plans for a machine shop costing about $50,000. Name of owner and location of the plant will be announced later.

TWO RIVERS, WIS.—City, care E. G. Donnelly, manager, contemplates building an electric power plant in the spring that will cost $100,000.

Southern States

BIRMINGHAM, ALA.—Birmingham airport is having plans drawn by H. W. Stanford, city engineer, for the construction of airport to include motor repair shops.

SMACKOVER, ARK.—Simms Oil Co. is preparing plans for oil refinery improvements to include new radial furnace for pipe stills and additions to boiler plant. F. N. Williams is plant superintendent.

JACKSONVILLE, FLA.—Continental Can Co. Inc., 1 Pershing square, New York, will erect a can manufacturing plant here.

ATLANTA, GA.—Prest-O-Lite Co. Inc., 30 East Forty-second street, New York, maker of torches, tanks and batteries, has received bids for the construction of warehouse and shop building here to cost about $80,000 and to be located at 345 Kuhrt street. Building will be 1-story, 58 x 96 feet.

SAVANNAH, GA.—United Shank & Findings, care E. R. Laird, general manager, Whitman, Mass., a subsidiary of United Machinery Co., Boston, will erect a manufacturing building here on Louisville road costing $100,000.

LOUISVILLE, KY.—Henry Vogt Machine Co., Tenth and Ormsby streets, has awarded contracts for plant addition.

LUDLOW, KY.—Southern railway, care B. Herman, chief engineer, 1300 Pennsylvania avenue, Washington, plans reconstruction of shops here to cost $300,000.

SHREVEPORT, LA.—City recently issued bonds for a municipal airport and has acquired 330 acres of land.

CHARLOTTE, N. C.—Frederickson Motor Express Corp., 425 West Liddell street, will erect a 2-story shop building, warehouse and garage, costing about $75,000.

CHARLOTTE, N. C.—Grinnell Co., 30 East Fourth street, maker of pipes, valves and fittings, is preparing plans for a new plant to replace present unit at North Charlotte, N. C. J. E. Sirrine & Co., 215 South Main street, are consulting engineers

KINSTON, N. C.—City, care Cecil Wooten, water and light committee, will receive bids until Feb. 21 for power plant equipment to include air cooler, crane, switchboard generator panel, surface condenser and turbo-generator unit. William C. Olsen Inc., Raleigh, N. C., is engineer.

BLACKWELL, OKLA.—City, care Dwight Randall, clerk, plans an airport.

PONCA CITY, OKLA.—City, care E. O. Bennett, manager, has let contract to Wheaton & Townsend Inc., Tulsa, Okla., for hangar at municipal airport. (Noted Dec. 26.)

TULSA, OKLA.—Big Four Foundry Co., 301 North Hartford street, will build a pattern shop and storage addition, 30 x 100 feet. Clarence Jeffries is superintendent.

TULSA, OKLA.—Magneto Ignition Co., 304 East Second street, has let contract for a new plant, 75 x 100 feet, to include repair shop facilities for rebuilding automobile and gas engine ignition systems. R. E. Day is general manager.

TULSA, OKLA.—Texas-Empire Pipe Line Co., care J. L. Culbertson, chief engineer, 709 Philtower building, will install eight additional pumping stations on the Cushing, Okla.-Chicago line. New equipment, including diesel oil-burning equipment, will be needed.

ROCK HILL, S. C.—City awarded contract for filtration plant addition costing about $50,000 to the McClellan Co., 122 Brevard court, Charlotte, N. C.

CHATTANOOGA, TENN.—Chattanooga Stove & Foundry Co., Forty-third street and belt railroad, has let contract to John Parks Co., 315 Oak street, for foundry building. (Noted Jan. 9.)

AMARILLO, TEX.—Board of education, care George W. Waddill, has final plans in progress for a 1-story manual training addition to the Buchanan street school.

BEAUMONT, TEX.—Magnolia Petroleum Co. is building a power plant here. Two steam turbines with 20,000 horsepower and boiler capacity will be used.

BEAUMONT, TEX.—Beaumont Iron Works, 1450 Crockett avenue, has placed contract for extension to foundry building and necessary equipment with Tellepsen Construction Co., 3900 Clay street, Houston, Tex. (Noted Sept. 19.)

CLEBURNE, TEX.—Santa Fe railroad, 80 East Jackson boulevard, Chicago, has awarded contract for the erection of shops here to Robert E. McKee Construction Co., 1918 Texas street, El Paso, Tex.

DALLAS, TEX.—Southwestern Bell Telephone Co., Telephone building, has let contract for a repair shop and garage building, 75 x 100 feet. B. D. Hull is chief engineer in charge of construction.

DALLAS, TEX.—National Lead Co., International Life building, St. Louis, has let contract for 75 x 130-foot plant at Terminal and Cadiz streets here. Cost with equipment will be about $42,000.

DALLAS, TEX.—Board of education, F. N. Noyes chairman, will receive bids March 15 for first wing of Dallas Technical school and reconstruction of present shops, all costing approximately $175,000. Architect is Herbert M. Greene, Construction building.

GOOSE CREEK, Tex.—City, care R. M. Manley, secretary, recently closed bids for the construction of a municipal power plant to cost $50,000.

HOUSTON, TEX.—Markel Steel Co. has been granted a permit to erect a 1-story shop addition, 100 x 129 feet. (Noted Sept. 19.)

SAN ANTONIO, TEX.—Air intermediate depot, Duncan field, care construction quartermaster, proposes erection of a depot shop here.

West Central

BURLEY, IDAHO—City recently voted favorably upon a bond issue for the construction of an airport and airport facilities.

CHERRYVALE, KANS.—Edgar Zinc Co. has awarded contract for erection of new smelting plant to Kansas City Structural Steel Co., Twenty-first and Metropolitan avenues, Kansas City.

CAMPBELL, MO.—City, care R. M. Jones, mayor, plans a light plant. Russell & Axon, 6200 Eaton avenue, St. Louis, are architects.

ST. LOUIS—Usona Mfg. Co., 3520 Chouteau avenue, has let contract to Kremer & Voirol, 1416 Chemical building, for 1-story wire plant addition.

Western States

BERKELEY, CALIF.—Electric Steel Foundry Co., 1328 Second street, will double plant capacity with construction of an addition to cost more than $30,000.

EUREKA, CALIF.—Pickwick Stage System will receive bids for construction of motor repair shops here through O'Brien Bros., architects, 315 Montgomery street, San Francisco. Cost is estimated at $30,000.

FRESNO, CALIF.—Irrigation Engineering Co. plans erection of 1-story shops on North H street.

FRESNO, CALIF.—New England Sheet Metal Works, 301 Broadway, awarded contract for 50 x 140-foot plant on San Benito street to W. T. Harris.

LOS ANGELES—Board of education plans a high school at St. George street and Griffin avenue to include shops, cost of which will be about $400,000. Architect is G. M. Lindsey, 609 Union Insurance building.

OAKLAND, CALIF.—American Creamery Co., Cypress avenue and Fourteenth street, plans to remodel present plant for a machine shop. Cost is approximately $200,000.

DENVER—McFarlane Eggers Machinery Co., 2763 Blake street, has purchased a tract adjoining present plant and will use the land for future expansion purposes.

PUEBLO, COLO.—Colorado Fuel & Iron Co., care W. A. Maxwell, production manager, has awarded general contract for the construction of 42 additional by-product coke ovens and auxiliary equipment to the Koppers Construction Co., Koppers building, Pittsburgh. (Noted Nov. 21.)

Canada

BRIDGEBURG, ONT.—Irving Air Chute Co., 372 Pearl street, Buffalo, will start work at once on the construction of a manufacturing plant here.

ESSEX, ONT—Utilities commission, care R. R. Brett, clerk, plans purchase of a new turbine unit for waterworks plant

CALGARY, ALTA.—Calgary Iron & Foundry Ltd., founder, machinist and welder, 410 East Ninth avenue, advises that having absorbed the Calgary Iron Works Ltd. it proposes to add structural and blacksmith shops. Machinery needed includes an open-side planer, turret lathe, steam or air hammer and molding machines.

FERGUS, ONT.—Beatty Bros. propose a plant addition for the manufacture of washing machines and will need equipment and machinery.

TORONTO, ONT.—Board of education, care C. E. Dyson, 155 College street, plans school units to include manual training department at Earl Beatty and Withraw schools.

TORONTO, ONT.—George Rathbone Lumber Co., Queen street and Gladstone avenue, having taken out a permit for plant addition to cost approximately $20,000, will soon purchase woodworking equipment and machinery.

REGINA, SASK.—W. D. Beath & Son Ltd., manufacturers of hoists and steel drums, 394 Symington avenue, Toronto, Ont., will start work here on the erection of a manufacturing plant

Recent Incorporations

MOUNTAIN VIEW, ARK.—Arkansas Valley Light & Power Co. has been incorporated by Ben B. Williamson.

SOUTHINGTON, CONN.—Plantsville Foundry Corp. has been incorporated with $50,000 capital to manufacture gray iron castings. Thomas Thomson is president. It is expected that the company will take over the abandoned foundry building formerly owned by the Walker-Stewart Foundry Corp. here.

EVANSVILLE, IND.—Midwest Concealed Bed Co. has been incorporated as a subsidiary plant of the Evansville Metal Bed Co. here by Emory K. Sherer, vice president of the latter company.

DETROIT—McLean Economy Gas Furnace Co., 6209 Hamilton avenue, has been incorporated with 2500 no par shares to manufacture and deal in heating and cooling units by G. A. Ellerthorpe, 5800 Lonyo avenue.

DETROIT—Automotive Lock & Products Co. Inc., 439 East Fort street, has been incorporated with 200 no par shares to manufacture and deal in auto locks, key locks, cutting machinery and special tools by Reuben Simon, Leominster, Mass.

HILLSDALE, MICH.—Hillsdale Screen Co., 103 East Railroad street, has been incorporated with $100,000 capital to manufacture and sell screen doors and ventilators by B. E. Hinkle and G. A. Duncan.

NEWARK, N. J.—L. & R. Mfg. Co. has been incorporated with $50,000 to manufacture mechanical devices by Israel Spicer.

NEWARK, N. J.—Paris Bedlite Co. has been incorporated with 2500 no par shares to manufacture lamps and fixtures by Rossbach & Crummy, attorneys. Prudential building.

NEWARK, N. J.—Harry I. Schneider Inc. has been incorporated with $50,000 to manufacture jewelry by Egner & Beatty, attorneys, 17 Academy street.

NEW YORK—Catalazuli Mfg. Co. has been incorporated with $20,000 to operate a machine shop by R. C. Pinkham & Co., Flushing, N. Y.

NEW YORK—Republic Metal Lath Materials Inc. has been incorporated with 600 shares of capital stock to deal in metal lath by John Kindred Gillette, 912 Second avenue, Long Island City, N. Y.

ROCHESTER, N. Y.—W. D. Shoeneman Inc. has been incorporated with capital stock of $50,000 to deal in iron, steel and copper by Walter W. Schoeneman, 137 Mitchell street.

DURHAM, N. C.—Young Roofing Co. has been incorporated with $40,000 authorized capital stock to deal in roofing, sheet metal and builders' supplies by Thomas W. Young.

BUCYRUS, O.—R. J. Winsor Inc. has been incorporated for the manufacture of automatic gravity dump carts propelled by caterpillar mechanism, production of which is now under way. R. J. Winsor is president.

PONCA CITY, OKLA.—Ponca Specialty Mfg. Co. has been organized to manufacture oil field specialties by L. J. Mildren, president, Bellaire apartments.

WICHITA FALLS, TEX.—Central Metal Co. has been incorporated with $5000 to engage in manufacturing by Louis G. Broad.

New Trade Publications

MOTORS—General Electric Co., Schenectady, N. Y., has issued a folder on its direct current mill motors for steel mill auxiliaries, shovels, dredges, cranes, hoists and bridges.

HAND-FORGED TOOLS—Ketler-Elliott Co., Chicago, has prepared a catalog of its line of tools, illustrated and with tables of dimensions price and code for ordering.

VALVES—Edward Valve & Mfg. Co., East Chicago, Ind., has issued a leaflet containing reproduced advertisements of its product, designed to give engineers an idea of the care exercised in their manufacture.

PORTABLE ELECTRIC TOOLS—A catalog of its portable electric tools has been issued by the Schauer Machine Co., Cincinnati, covering its entire line. This includes drills, screwdrivers and grinders.

ALUMINUM—Three booklets are being distributed by the Aluminum Co. of America, Pittsburgh, dealing with screw machine products of aluminum, the riveting and the welding of aluminum. Each treats its subject at length, with illustrations and data tables.

LOCK NUTS—Kraberhall Inc., Philadelphia, has prepared for distribution a movable pasteboard cross-section of one of its pin-nuts, in which, by means of pins inserted tangentially between bolt and nut the latter is locked against loosening by vibration. Action of the pins is described in the text.

ROCK DRILL STEEL—A booklet on steels for rock drills has been issued by the Sullivan Machinery Co., Chicago. Dependence of the entire equipment and operation on the quality of steel in the bit which cuts the rock is emphasized and instructions are given as to the quality and handling of the steel. Operation of two types of drill sharpeners is described. A chapter is devoted to pyrometers and pyrometer control and one on the magnetic indicator to indicate the critical point in heating steel for forging or tempering. Heat treating of drill steel is described.

ELECTRIC WELDING—Seam welding as accomplished by devices of the Thomson-Gibb Electric Welding Co., Lynn, Mass., and Bay City, Mich., is set forth in a bulletin by that company. An illustration shows the welder and specifications describe its construction and operation.

TUNGSTEN CARBIDE—Norton Co., Worcester, Mass., has published a booklet on the proper method of grinding cemented tungsten carbide. Since this metal cannot be machined with any known metal tool it must be shaped by grinding. Problems of economically shaping and resharpening are treated in this booklet.

STEEL FRAME HOMES—American Institute of Steel Construction Inc., New York, in a current bulletin calls attention to advantages of steel frame construction for residences and to battledeck welded floors for larger structures. Strength, lightness and rigidity are advantages claimed for this type of floor.

ELEVATOR DRIVES—H. W. Caldwell & Son Co., Chicago, a subsidiary of the Link-Belt Co., has issued a 23-page folder on its new type drive for bucket elevators. The folder describes the drive in detail and cites its advantages. Specifications, sprocket ratio charts and layout drawings are included in the booklet. A price list accompanies the booklet.

ARC WELDERS—General Electric Co., Schenectady, N. Y., has issued two folders on its gas-engine-driven arc welders. One has a rating of 300 amperes, 25 volts, 1 hour, 50 degrees Cent. and is driven by a Buda gas engine. The other has a rating of 200 amperes, 25 volts, 1 hour, 50 degrees Cent., and is driven by a Continental unit.

NICKEL STEEL—International Nickel Co., New York, has prepared a reprint of a paper on the manufacture of nickel steel plate, from proceedings of the American Society of Mechanical Engineers. It deals with the manufacture, rolling and inspection of steels containing 2 to 3 per cent of nickel for boiler construction. It is illustrated.

BALL BEARINGS—Fafnir Bearing Co., New Britain, Conn., has issued a booklet on applications of its ball bearings in aircraft construction. It calls attention to the increasing use of these bearings in connection with airplane control mechanism as an added safety medium, and explains in detail the various ways they have been used. Charts and data sheets present facts as to use of the bearings for various parts.

CARBON CIRCUIT BREAKERS—A type of carbon circuit breakers is illustrated and described in a bulletin by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Illustrations show installations in a variety of uses, in a steel mill, a coast guard cutter and in office building. A brief history of the development of this type of circuit breakers is included in the foreword.

MOTOR CONTROL—A booklet devoted to practical pointers on the selection of motor control has been issued by Cutler-Hammer Inc., Milwaukee. It stresses the features to consider when choosing motor control, with reference to the motor's load, for alternating and direct current. It is written by an electrical engineer, in practical language. The text is supplemented by numerous illustrations.

Pipe and Tube Prices—Plate Extras

Steel Pipe

(Base price $200 per ton)

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

To large jobbers these discounts are increased by 1 point and two supplementary discounts of 5 per cent on black, and 1½ points and two supplementary discounts of 5 per cent on galvanized.

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld

	Black	Galv.
⅛ and ¼-inch	+11	+36
⅜-inch	23	5
½-inch	28	11
¾ and 1¼-inch	31	15
1½ and 2-inch	35	18

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	9
2½ to 3½-inch	28	12
4 to 6-inch	30	17
7 and 8-inch	29	16
9 to 12-inch	26	11

REAMED AND DRIFTED

2-inch to 6-inch—Two points less than above

EXTRA STRONG, PLAIN ENDS

⅛ and ¼-inch	+13	+48
⅜-inch	23	7
½-inch	28	12
¾-inch	34	18
1to 2-inch		

Lap Weld

2-inch	29	13
2½ to 4-inch	34	20
4½ to 6-inch	33	19
7 and 8-inch	31	17
9 to 12-inch	21	8

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

Jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized wrought iron pipe.

On extra or double extra strong pipe fitted with threads and couplings basing discount lowered 5 points from plain end price. Fitted with threads only, basing discount lowered 3 points for random lengths.

Boiler Tubes

Pittsburgh carload discounts

STEEL (Lap Weld)

2" and 2¼-inch	38 off
2½ and 2¾-inch	46 off
3-inch	52 off
3¼ to 3¾-inch	54 off
4-inch	57 off
4½ to 6-inch	46 off

Subject to two 5 per cent discounts on full carload shipments. On less than 10,000 pounds, base discount reduced 6 points and one 5 per cent allowed. Over 10,000 pounds to carload, base discount reduced 4 points and two 5 per cents allowed.

CHARCOAL IRON

1½-inch	1 off
1¾-inch	8 off
2 and 2¼-inch	13 off
2½ and 2¾-inch	16 off
3-inch	17 off
3¼ to 3½-inch	18 off
4-inch	20 off
4½-inch	21 off

Subject to 10 per cent discount on full carload lots. On less than 10,000 pounds, base discount reduced 2 points and no preferential allowed. On 10,000 pounds to carload, 5 per cent preferential allowed.

SEAMLESS COLD DRAWN

1-inch	61 off
1¼ and 1½-inch	53 off
1¾-inch	37 off
2 and 2¼-inch	32 off
2½ and 2¾-inch	40 off
3-inch	46 off
3¼ and 3½-inch	48 off
4-inch	51 off
4½, 5 and 6-inch	40 off

SEAMLESS HOT ROLLED

1¾-inch	37 off
2 and 2¼-inch	38 off
2½ and 2¾-inch	46 off
3-inch	52 off
3¼ and 3½-inch	54 off
4-inch	57 off
4½, 5 and 6-inch	46 off

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed.

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.30 per cent.....55 to 55 off

Carbon 0.30 to 0.40 per cent.....45 to 50 off

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Gage	Net price per foot f.o.b. Pittsburgh Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅝-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for lengths over 24 feet.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, date Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inch long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weight.

Over 100 to and including 110 inches	.05c
Over 110 to and including 115 inches	.10c
Over 115 to and including 120 inches	.15c
Over 120 to and including 125 inches	.25c
Over 125 to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 to and including 84 inches	.10c
Over 84 to and including 96 inches	.20c
Over 96 to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates Not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds square foot..... .20c

Plates Over 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 11 pounds per square foot to but not including 7.65 pounds square foot.... .20c

Plates ordered 7.65 pounds square foot .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. specifications for medium or soft steel	.10c
High tensile hull steel subject to U. S. navy department or equivalent specifications	1.00c
Boiler steel subject to U. S. navy department specifications, class A-B..	1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.	

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection ..... No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet.....No extra

Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra ..... .20c